DOCUMENT RESUME

ED 071 700 LI 004 097

AUTHOR	Brophy, P.; And Others
TITLE	A Library Management Game; A Report on a Research Project.
INSTITUTION	Lancaster Univ. (England). Library.
PUB DATE	72
NOTE	96p.; (51 References); University of Lancaster Library Occasional Papers, No. 7
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Educational Games; *Information Science; Library Education; Library Schools; *Library Science; Management; *Management Games; Models
IDENTIFIERS	*Information Science Education

ABSTRACT

For thirteen months from June 1971 the Office for Scientific and Technical Information supported members of the Library Research Unit, University of Lancaster, in an investigation of the feasibility of designing computer-aided games to assist in teaching the principles and techniques of management to students of librarianship and information science. This volume is a report of the feasibility study, which resulted in the development, to prototype stage, of one such management game; it is expected that further work will result in "production models" of this and other games, for use in actual teaching situations. (Author/SJ)

University of Lancaster Library Occasional Papers, No. 7

A LIBRARY MANAGEMENT GAME

A Report on a Research Project

by

P. Brophy, M. K Buckland, G. Ford,
A. Hindle and A. G. Mackenzie;
with an appendix by L. C. Guy

University of Lancaster Library
1972

Printed by
University of Lancaster
Central Printing Unit

PREFACE

This report is the seventh in a series of papers which are published, at irregular intervals, to make available the results of research work carried out by members of the Library staff (see inside back cover for previous titles).

For thirteen months from June 1971 the Office for Scientific and Technical Information supported members of the Library Research Unit in an investigation of the feasibility of designing computer-aided games to assist in teaching the principles and techniques of management to students of librarianship and information science. The present paper is a report of this feasibility study, which resulted in the development, to prototype stage, of one such management game; it is our expectation that further work will result in "production models" of this and other games, for use in actual teaching situations.

Sadly, this paper must also record the departure of a key member of the Research Unit: Dr. M.K. Buckland, who has played a major part in every project undertaken since 1967, and has indeed initiated a number of them, has now taken up a senior post in Purdue University Library. His replacement as Assistant Director of the Unit, from 1st April 1972, is Mr. M.G. Ford.

July 1972

A. G. Mackenzie
University Librarian
and
Director, Library Research Unit

CONTENTS

I. INTRODUCTION. THE USE OF GAMES IN EDUCATION

(a) Games as Educational Tools

Although the use of games in professional education has become widespread only during the last decade, the method has been used in a number of fields for many hundreds of years. Its origins have been traced to simple war games, used in military training when the "real thing" was either unavailable or too dangerous. In more recent times, these games have become more and more sophisticated, and many now use large electronic computers to handle the complex calculations involved. Since 1956, when the first well-developed management game was introduced (33), the technique has spread rapidly into a wide variety of disciplines (17,22,23,25,36,40,45) and today it is used at all levels of education, from primary school classes to courses for experienced professional men and women. One of the main causes of this "game explosion" has been the rapid development of sophisticated management techniques, such as simulation and mathematical modelling, which have been made possible by rapid advances in computer technology.

The principal use of games in education is not as a substitute for the more traditional teaching methods, such as lectures and seminars, but as a complement to them. A well-designed game is capable of giving the student some understanding of the complex interactions involved in any real system, without defining these interactions explicitly; this is important because many students experience difficulty in understanding the complex mathematics required to describe a real system. Furthermore students cannot be expected to attain an overall grasp of the behaviour of a system merely by attending lectures in which basic principles are taught, unless a way is found to bring these principles together into a coherent, well-balanced and recognisable form; here again the educational game can help by providing an over-view of the system. The use of games in teaching students who have no natural inclination to investigate the interactions on which they are based has been emphasised by Bruner (4):

"It can be demonstrated that fifth-grade children can play mathematical games with rules modelled on highly advanced mathematics; indeed they can arrive at these rules inductively and learn how to work with them. They will flounder, however, if one attempts to force upon them a mathematical description of what they have been doing, though they are perfectly capable of guiding their behaviour by these rules."

There are even more advantages to be gained from the use of games as teaching aids. Almost invariably the student is better motivated to learn and takes more interest in his subject (1,10), gains an overall "feel" for the real situation which is comparable to that gained by experience (2), will often undergo a change in attitude towards his course, and an increase in confidence in his own ability as a decision-maker (2).

Although some criticism has been levelled at educational gaming on the grounds that it may not be as effective, nor as widely applicable, as has been claimed, the weight of evidence suggests that when games are used in a well-designed environment they are an exceedingly effective teaching aid. Kraft(26), among others, has suggested that "few if any students will acquire a deeper understanding of social processes by playing games" although he goes on to say that "one can hardly object to games and simulation methods in certain fields - military tactics, mathematics, business management". There have been few thorough investigations of the effectiveness of games as educational tools, but those which are available have produced similar results. Raia(32) summarised his findings in the following way:

i) "Game playing heightens interest and motivation."

ii) "When used as a supplementary teaching aid, games enhance learning and heighten student interest and motivation..... In terms of learning ..... game participants scored significantly higher on all parts of the final written examination than those who did not play."

iii) "Participation (in the games) did not adversely affect the students' ability to analyse business cases"

iv) No significant differences in attitude (to the course) were found although students stated that they preferred the game as an instructional aid.

v) The benefits derived from a game are not directly related to its complexity - "added complexity is probably not profitable beyond a certain point."

(b) Types of educational game

We have made no attempt to define rigorously our concept of an "educational game" since the boundaries separating games, simulations, practical classes, seminars and even lectures are fluid. Furthermore, much of the terminology used in this field is ambiguous or misleading - "game theory", for example, has little relevance to educational gaming, and the verb "simulate" can have a number of meanings - from "to have or assume a false appearance"(12) to a word which "delineates a range of dynamic representations"(39). In this report we incline to the latter definition. However, in order to clarify the terms which are commonly met in the field, we describe below the various types of game and related techniques which are in common use today.

i) Case Studies These exercises are not strictly simulations (i.e. they are not dynamic representations), but descriptive studies of the state of a system at one or more points in the past. The student is required to analyse and discuss the system as it is presented to him, but there is no possibility of the system being modified as a result of the student's

actions. Case studies have been used widely in education for librarianship(20,21,28,35) (there are indeed few library schools which do not make some use of them) and have made a valuable contribution to the understanding of the real library system.

The basic limitation of case studies is that they cannot simulate the passage of time - "No matter how realistic the symbolism might be surrounding decisions issues in a case, once decisions have been made and discussed the case model has served its usefulness."(15) Despite this limitation the case study forms a preliminary step in the design of most models.

ii) "In-tray" Exercises. In these exercises, which are an extension of the case study, the individual student is called upon to play a specific rôle and must, in isolation, deal with the problems and take the decisions which that rôle demands. His responses are sometimes marked in order to assess his performance, and a time-limit can be set in order to increase the pressure upon him.

In library schools, the rôle played by the student is often that of the librarian, and the student might be required to deal with each item in the morning post(18). The Manchester Public Libraries Library Management Game on the other hand, involves the simulation of the steps in the career of a librarian, and requires a number of students to work more or less independently within a group(11). A computerised version of an in-tray exercise has recently been developed at one American library school(44).

iii) The "Incident" Process. This type of exercise is a further development of the case study: it restricts the amount of information given to the student at the beginning of the exercise, forcing him to assess his information requirements. He must then demand the information he needs before taking a decision. These exercises therefore introduce to the student the need to demand information on which to base decisions, and force him to realise the difficulty of determining exactly the information which is required(31).

iv) Rôle-Playing. Essentially this type of exercise requires a group of students to take part, interactively, in a "life-like" situation and to discuss their actions and the development of the situation among themselves. The technique is used particularly as a method of gaining insight into problems of personnel management and human relations. In librarianship, rôle-playing exercises have been used to teach interviewing techniques(18).

v) Simulation-Gaming. The participants in these exercises take decision-making rôles in hypothetical environments. They make decisions on the basis of the information supplied to them, note the effects of these decisions on the system, as represented by the model, and adjust their behaviour accordingly. The models must therefore be dynamic and for this reason they are usually computer-based, although in the simplest simulation-games the computer may be human. Although widespread

in many fields, and particularly in management(13), as far as we know there have been no simulation-games in librarianship or information science management.

In essence, the main characteristics of a simulation-game are as follows:-

(a) The simulation of the environment is created in such a way as to allow feedback of the results (e.g. values of the measures of performance) to the student.

(b) The characteristics of this environment must be expressed, at least implicitly, as logical or mathematical relations. For example, the rules of most games are a logical expression of certain restrictions on the players.

(c) The presence of logical and mathematical relations necessitates the use of a computer. The rôle of the computer (which may be human, mechanical or electrical) is to use the defined mathematical and logical relations in order to determine the simulation's response to the student's actions.

(d) Every simulation-game is a simplification - sometimes a very drastic simplification - of the real system which it represents.

Case studies, in-tray exercises and rôle-playing have been used extensively in library schools both in this country(18) and abroad(37). These types of game are covered only briefly in this report - our main concern is with simulation-gaming in the field of library and information service management. Thus one of our main aims has been to assess the value of dynamic educational models in teaching management to students of library and information science.

II. THE FEASIBILITY STUDY - AN OVERVIEW

(a) Aims and Objectives

In the light of our experience with operational models in library management we considered that it would be well worth investigating the feasibility of developing such models as educational games, to be used in teaching students (of whatever age or seniority) how to improve their grasp of the principles of library and information service management. The feasibility study was therefore designed to include the following activities:

i. Wide-ranging consultation with potential users of this type of game, particularly the library schools in Britain and abroad, and with other interested bodies. The aim of this consultation was to be two-fold - to inform potential users of the work which we proposed to do, and to inform ourselves of the users' needs and of the facilities available to them.

ii. Investigations of the "state-of-the-art" of education for library management, in order to determine the present content of syllabuses, and whether advanced management techniques are covered. These investigations were also to cover the place of gaming in the syllabuses, the methods used at present, and the general time-constraints.

iii. A detailed design study for a library management game, including the identification of a suitable model for development and a study of the problems likely to be met in converting it into a game.

iv. Consideration of the managerial problems of all types of information service, and particularly those with which we are not ourselves familiar (such as industrial information units). The aim of this part of the study was to be the examination of the potential scope of educational gaming in librarianship and information science.

v. The design of a methodology for the evaluation and testing of a library management game, in order to determine whether such a game would be (a) valuable in educational terms, and (b) adopted by the schools (or other bodies).

vi. The determination of methods for comparative costings of various modes of the proposed game:

(a) Interactive with the computer.
(b) Mixed manual/computer-aided.
(c) Entirely manual.

At the beginning of the feasibility study we decided that the most convincing proof of the feasibility of gaming in librarianship and information science would be provided if we could design, develop and demonstrate a prototype game. Objective iii. (above) was amended accordingly.

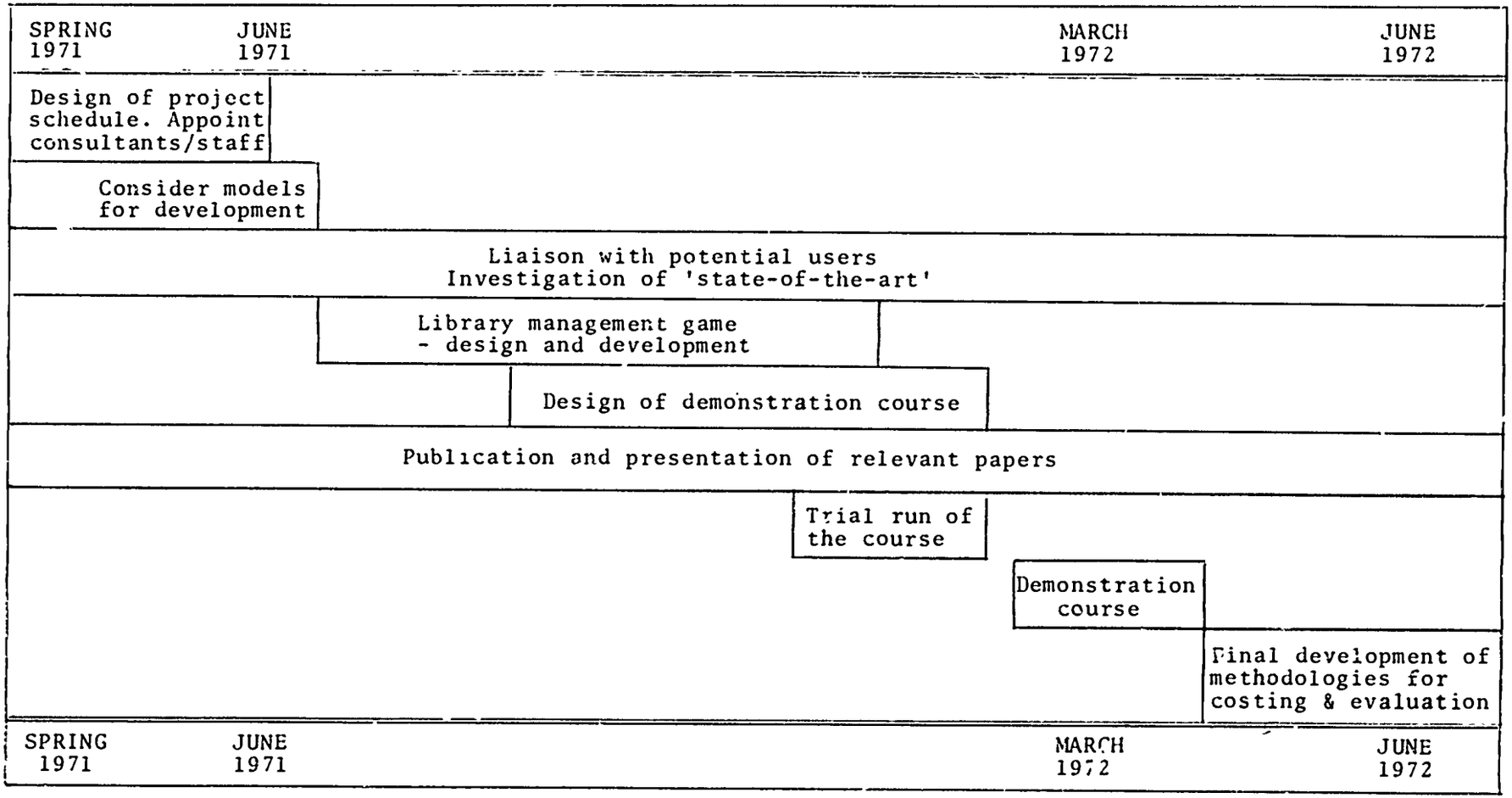

FIG. 1. THE SCHEDULE OF THE FEASIBILITY STUDY

(Note that the scale is not linear)

(b) The Schedule of the Feasibility Study

Although the study has lasted for only one year, it has included a number of discrete phases, some of which overlapped to a considerable degree. Some phases were planned in detail at the beginning of the project, others developed as the need for them became apparent. Fig.1 outlines the progress of the study throughout the year. Of course, this diagram does not represent the different emphases which were placed on different aspects of the project at different times. For instance, it was necessary initially to spend time familiarising ourselves with past research on educational games, and some members of the project team had also to familiarise themselves with our previous research. Towards the end of the project, a number of minor aspects of the subject had to be studied in order to produce a complete report.

Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontractor or purchase order as the Oklahoma Department of Libraries or the Office of Education may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Oklahoma Department of Libraries or the Office of Education, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

2. The invitation-for-bid documents which are furnished to prospective bidders shall include the following paragraph:

Notice of Requirements for Certification of Nonsegregated Facilities--Bidders are cautioned as follows: By signing this bid, the bidder will be deemed to have signed and agreed to the provisions of the "Certification of Nonsegregated Facilities" in this solicitation. The Certification provides that the bidder does not maintain or provide for his employees facilities which are segregated on a basis of race, creed, color, or national orgin, whether such facilities are segregated by directive or on a de facto basis. The Certification also provides that he will not maintain such segregated facilities. Failure of a bidder to agree to the Certification of Nonsegregated Facilities will render his bid nonresponsive to the terms of solicitations involving awards of contracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity clause.

INSTRUCTIONS FOR PREPARATION OF PNRS FORM

Please type or print all entries

SAI & CARD TYPE. Leave blank. State Clearinghouse will assign a number.

LINE 01. Applicant Project Title. A brief description name of the project. Use location of the project title when feasible. For Example: "Altus Airport Expansion".

LINE 02 Applicant Agency. The state agency, county, city, town or other unit of government authorized and making application for federal aid.
Division. When applicable, the sub-agency of the applicant responsible for administering the project i.e., City Police Department.

LINE 03 Address. Official mailing address of the applicant.

LINE 04 Contact Person. The representative of the applicant, or the applicant, considered as legally authorized to act on behalf of the project, and his telephone number.

LINE 05 to 10 Project Description. A brief narrative description of the nature, purpose and beneficiaries of the project.

LINE 11 Project Location City. The city or town primarily benefiting from the project.
Project Location County. The county primarily benefiting from the project or the county in which the impact city is located.

LINE 12 Federal Funds-Grant. Enter total amount of money received in the grant. Please use numbers ONLY. DO NOT USE dollar signs, commas or decimals. Your amount should reflect rounding to the nearest dollar and omit the CENTS.

Example:
$ 12,000.33
should be
12000

ground of race, color, or national origin. (Appendix 4.)

LINE 12 (Continued). Other Funds. Enter total amount of money received from private donations, fellowships, etc., observing format for reporting money.

Total Funds. Enter dollar amounts as applicable observing reporting format.

LINE 13

Type of OTHER FEDERAL Funds. When LINE 12, "Federal Funds-Other" is used, please indicate on LINE 13 the type of funding used. For Example: Farmers Home Loan, etc.

Type of OTHER NON-FEDERAL Funds. When LINE 12, "Other Funds" is used, please indicate on LINE 13 the type of funding used. For Example: Ford Foundation, any private donation, etc.

LINE 14

Federal Program Title. Enter program title as listed in OEO catalog of Federal Domestic Assistance.

LINE 15

Federal Agency Name and Federal Sub-Agency. Enter the administering federal agency and sub-agency as listed in the OEO catalog, i.e., Department of Agriculture, FHA.

LINE 16

Federal Catalog Number. Enter the Federal Catalog Number for the project as listed in the Federal Domestic Assistance Catalog.

Action, Starting, and Ending Dates. Enter if known.

character similar to the contract work as determined by the Secretary of Labor.

The provisions contained herein must be included in each construction contract in excess of $2,000 that requires that the employment of laborers and mechanics on the site of the work.

The successful bidder will be expected to familiarize himself with and conform to all provisions of the pertinent labor standards, including the applicable provisions concerning minimum rates determined pursuant to the Davis-Bacon Act, overtime requirements of the Contract Work Hours Standards Act, and the anti-kickback provisions of the Copeland Act. Any violations of these standards can result in the withholding of Federal funds with respect to the project and other penalties.

After the contract is awarded but before any work is started on a project, the applicant should arrange a preconstruction conference with all interested parties to clarify the pertinent administrative requirements of the labor standards. The conferees should include prime contractors and subcontractors, and appropriate representatives of the Oklahoma Department of Libraries and local library.

The terms "applicant" and "owner" are used synonomously in this section.

PROCEDURES BEFORE BIDDING

1. Wage Determination

The applicant submits a wage determination request to the Oklahoma Department of Libraries for forwarding to the Office of Construction Service, U.S. Office of Education, not to the Department of Labor. The request should reach the Office of Construction Service no less than five weeks before the date of bid opening.

The Office of Construction Service will return three copies of the wage determination to the Oklahoma Department of Libraries. The Oklahoma Department of Libraries will keep one copy and send others to the applicant.

A U. S. Department of Labor wage determination with its amendments is effective for 120 days from date of determination. If the initial wage determination is not used in the period of its effectiveness, it is void. If it appears that it will expire between bid opening and award, the applicant should request a new determination sufficiently in advance of bid opening to assure receipt prior thereto. However, when due to unavoidable circumstances a determination expires before award and after bid opening, the Solicitor of Labor may extend the expiration date of a determination if he finds it necessary and proper to prevent injustice or undue hardship. In such cases the extension is based upon written evidence of injustice or hardship to be submitted by the Oklahoma Department of Libraries to the U. S. Office of Education for transmittal to the Department of Labor. (29 CFR Parts 5.3 and 5.4.)

The Oklahoma Department of Labor revises its wage determinations for each county at the beginning of each fiscal year (July 1) and this determination is effective for

Line 17 (Continued) Sponsored Organization - a public-purpose organization, other than an organizational unit of government that is a beneficiary under a plan or program administered by a State or a political subdivision of a State, county, or city and which is subject to approval by a Federal agency (e.g. Economic Development Districts).

Other - if the applicant is not covered by any of the previously mentioned types.

Type of Action (Check most applicable boxes with a X.

New Grant - an action considered by the grantor to be an award of a new grant.

Continuation Grant - an action that constitutes a continuation action within a multi-year grant (e.g. the second year award under a five year project period grant).

Supplement Grant - an action that increases the Federal contribution in certain cases where the eligible applicant cannot supply the required match share of the basic Federal program

the following fiscal year. The bid must contain the state wage determination of the fiscal year in which the bid will be opened and awarded, then this state wage determination of this bid awarding continues to be in effect during the duration of the contract.

The contractor must pay at least as much as the top pay scale of the Federal or the State (whichever is higher) wage determination for each job position.

2. Insertion of required contract clauses

These are usually included as part of the General Conditions (Contract documents) in the specifications for bidders. It is the responsibility of the applicant and the Oklahoma Department of Libraries to check on both the bid specifications and in the contract to see that they are included. For required clauses see Appendix B (29 CFR Part 5.5 (a) and (c) and the nondiscrimination clause prescribed by Executive Order No. 10925 of March 6, 1961 (26 F.R. 1977), as amended by Parts II and III of Executive Order No. 11114 of June 22, 1963. (28 F.R. 6485)

COMPLIANCE PROCEDURES AND INVESTIGATIONS AFTER BID AWARD

1. Posting of Minimum Wage Determination. The wage rate determination shall be posted by the contractor at the site of the work in a prominent place where it can be easily seen by the workers. It is the responsibility of the applicant to see that it is so posted. (29 CFR 5.5 (a) (1) (i))

2. Payroll Retention and Submission

a. Payrolls and basic payroll records of the Contractor and Sub-Contractors will be maintained during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records will contain the name and address of each such employee, his correct classification, rate of pay, daily and weekly number of hours worked, deductions made, and actual wages paid. The Contractor will make his employment records available for inspection by authorized representatives of the Oklahoma Department of Libraries, the Secretary of Labor, and the U. S. Office of Education, and will permit such representatives to interview employees during the working hours, on the job. (29 CFR Part 3.4 (b).)

b. The Contractor will submit weekly a copy of all payrolls to the owner ~~(applicant) or his duly~~ authorized representative. The copy shall be accompanied by a statement indicating that the payrolls are correct and complete, that the wage rates contained therein are not less than those determined by the U. S. Secretary of Labor or the Oklahoma Commissioner of Labor and that the classifications set forth for each laborer or mechanic conform with the work he performed. The submission of a "Weekly Statement of Compliance" (See sample form Appendix 9)which is required under this contract and the Copeland regulations of the Secretary of Labor (29 CFR, Part 3) shall satisfy this requirement. Such copies shall be retained for a period of three years from the completion of the contract and shall be available for inspection by authorized representatives of the Oklahoma Department of Libraries, the Secretary of Labor, and the U. S. Office of Education. Receipt and maintenance of such copies is the initial responsibility of the applicant. It is the responsibility of the Oklahoma Department of Libraries to see that these are being properly received and kept. Later, the file may be transferred from the applicant to the Oklahoma Department of Libraries. (29 CFR Parts 3.3 and 3.4 (a)).

Reissued: 7-1-71
ODL/LSB - 6/11/70

3. Payroll Examination. All payrolls will be checked by the applicant against the applicable wage determination decisions of the U. S. Secretary of Labor and of the Oklahoma Commissioner of Labor to verify labor standards compliance and to ascertain the following:

(a) That the rates paid to various classification of employees are not less than these specified in the applicable wage determination.

(b) That the ratio of apprentices to journeymen is not disproportionate.

(c) That the ratio of laborers to journeymen is not disproportionate.

(d) That the ratio of helpers to journeymen is not disproportionate.

(e) That each classification shown in the payrolls is a classification for which a rate was predetermined in the applicable wage determination.

(f) That there are included in the payrolls those classifications of workers who would according to the progress of construction, logically perform the work carried on during the weeks in question. (29 CFR Part 5.6 (2))

4. On the Job Interviews. The Oklahoma Department of Libraries shall make on "on the site" labor standards check of an employee in each classification or craft, at least once a month during the project including without limitation the following:

(a) Interviewing of a representative number of employees including but not necessarily limited to one employee in each classification or craft to ascertain what work the employee is doing, the hours he has worked, and his regular rate of pay. This information shall be checked against the payrolls and the applicable wage determination decision to verify compliance.

(b) Checking of the registration of all apprentices. (See Contract clause: APPRENTICES in Appendix B .) The investigator should use an interview form and may use one such as the "Routine Labor Relations Interview," a copy of which is attached (Appendix 10). Such a report properly signed, should be attached to the applicant's copy of the payroll record for the week in which the interview was made.

Upon arriving for the interview, the investigator should tell the contractor or project engineer the purpose of his visit. The actual interviews are then conducted out of sight and hearing of the employee's supervisor and the contractor. In conducting investigations, including those of complaints of alleged violations, all statements, written or oral, made by an employee are to be treated as confidential and shall not be disclosed to his employer without the written consent of the employee. (29 CFR Part 5.6 (3)).

If there is evidence of labor standards non-compliance, restitution shall be required of the contractor or sub-contractor, and the owner shall, after written notice to the contractor, withhold from the contractor such advances, guarantees, and accrued payments as are administratively determined necessary to cover any liquidated damages and the restitution due laborers and mechanics employed by the contractor or sub-contractor. The owner also has the option of terminating the contrast in accordance with its provisions. If there is evidence that the violations were aggravated, willful, or resulted in underpayments of $500 or more, a detailed report, including information as to restitution made; payments, advances, and guarantees of funds withheld, contract terminations; and the name and address of

Contract Clauses

GENERAL CONDITIONS

WAGE RATES

(a) There shall be paid each laborer or mechanic of the Contractor or subcontractor engaged in work on the project under this contract in the trade or occupation not less than the hourly wage rate established by the U. S. Secretary of Labor or the Oklahoma Commissioner of Labor (whichever is the higher) regardless of any contractual relationship which may be alleged to exist between the contractor or any subcontractor and such laborers and mechanics.

(b) If, after the award of the contract, it becomes necessary to employ any person in a trade or occupation not classified in the wage determinations, such person shall be paid at not less than such rate as shall be determined by the officials mentioned above. Such approved minimum rate shall be retroactive to the time of the initial employment of such person in such trade or occupation. The Contractor shall notify the Owner of his intention to employ persons in trades or occupations not classified in sufficient time for the Owner to obtain approved rates for such trades or occupations.

(c) The specified wage rates are minimum rates only, and the Owner will not consider any claims for additional compensation made by the Contractor because of payment by the Contractor of any wage rate in excess of the applicable rate contained in this contract. All disputes in regard to the payment of wages in excess of those specified in this contract shall be adjusted by the Contractor.

(d) Except as may be otherwise required by law, all claims and disputes pertaining to the classification of labor employed on the project under this contract shall be decided by the Owner's governing body or other duly designated official.

APPRENTICES

Apprentices shall be permitted to work only under a bona fide apprenticeship program registered with a State Apprenticeship Council which is recognized by the Federal Committee on Apprenticeship, U. S. Department of Labor; or if no such Council exists in a State, under a program registered with the Bureau of Apprenticeship, U. S. Department of Labor.

OVERTIME COMPENSATION

This contract is subject to the applicable provisions of the Contract Work Hours Standards Act, Public Law 87-581, 87th Congress.

(a) Overtime Requirements

No contractor or subcontractor contracting for any part of the contract work shall require or permit any laborer or mechanic to be employed on such work in excess of eight hours in any calendar day or in excess of forty hours in any workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all hours worked in excess of eight hours in any calendar day or in excess of forty hours in such workweek, as the case may be.

ODL/LSB 6-11-70
Reissued: 7-1-71

completed work conforms with the approved plans and specifications.

9. Size of the building, design, kind of construction, and facilities to be provided should be based upon the written library building and development program. In general, the building should be adequate to meet present needs and make future library development possible.

each laborer and mechanic and contractor or subcontractor affected, and the day or days of such violations, shall be submitted by the owner through the Oklahoma Department of Libraries to the U. S. Office of Education. No report need be made where the underpayments total less than $500, if non-willful, if restitution has been made, and if the State has received assurance of future compliance. (29 CFR Parts 5.6 and 5.7).

Federal Regulations (29 CFR Part 3) pursuant to Copeland Act and 29 CFR Part 5 pursuant to the Davis-Bacon Act and the Contract Work Hours Standards Act.

Copies of these parts of the Federal Regulations have been furnished the Oklahoma Department of Libraries. It is suggested that these be studied carefully. For that purpose citations to the pertinent section of the REGULATIONS are made at the end of each item.

Reissued: 7-1-71
ODL/LSB - 6/11/70

20. In the case of grant for remodeling or enlargement of existing facilities, the applicant must provide a certificate of worthiness signed by an Oklahoma registered professional engineer whose specialty is civil or structural engineering stating that the present building is structurally sound; and the finished building must meet all the building criteria for new construction.

(b) Violations: liability for unpaid wages; liquidated damages.

In the event of any violation of the clause set forth in paragraph (a), the contractor and any subcontractor responsible therefore shall be liable to any affected employees for his unpaid wages. In addition, such contractor or subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed, with respect to each individual laborer or mechanic employed in violation of the clause (a), in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of eight hours or in excess of forty hours in a workweek without payment of the overtime wages required by the clause (a).

(c) Withholding for unpaid wages and liquidated damages.

The Oklahoma Department of Libraries may withhold, or cause to be withheld from any monies payable on account of work performed by the Contractor or subcontractor, the full amount of wages required by the contract and such sums as may administratively be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for liquidated damages as provided in clause (b).

(d) Insertion of clauses in subcontracts.

The contractor agrees to insert the foregoing clauses (a), (b), and (c), this clause (d), and the following three paragraphs in all subcontracts.

Employees Covered.

Except as otherwise expressly provided in the Act, the provisions of the Act shall apply to all laborers and mechanics, including watchmen and guards, employed by any contractor or subcontractor in the performance of any part of the work contemplated by any such contract. ("Act" as used in this and the following two paragraphs refers to the Contract Work Hours Standards Act, Public Law 86-581, 87th Congress.)

Regulations.

The Regulations issued by the U. S. Department of Labor with respect to the Act (and incorporated by reference in the Regulations issued by the U. S. Department of Health, Education, and Welfare with respect to the Library Services and Construction Act, Public Law 597, 84th Congress, as amended) shall apply to this contract.

Penalty.

Any contractor or subcontractor whose duty it shall be to employ, direct, or control any laborer or mechanic employed in the performance of any work contemplated by this contract who shall intentionally violate any provision of this Act, shall be deemed guilty of a misdemeanor, and for each and every such offense shall upon conviction be punished by a fine of not to exceed $1,000 or by imprisonment for not more than six months, or by both such fine and imprisonment, in the discretion of the court having jurisdiction thereof.

POSTING MINIMUM WAGE RATES

The Contractor shall post at appropriate conspicuous points at the site of the project a

Reissued: 7-1-71
ODL/LSB 6-11-70

schedule showing all determined minimum wage rates for the various classes of laborers and mechanics to be engaged in work on the project under this contract and all deductions, if any, required by law to be made from unpaid wages actually earned by the laborers and mechanics so engaged.

PAYMENT OF EMPLOYEES

The Contractor and each of his subcontractors shall pay each of his employees engaged in work on the project under this contract in full (less deductions made mandatory by law) in cash and not less often than once each week less legally required deductions and also deductions made pursuant to the regulations prescribed under the so-called "Anti-Kickback Statute" (48 Stat. 948; 18 U.S.C. 974; 40 U.S.C. 278c); Provided, that when circumstances render payment in cash infeasible or impracticable, payment by check may be effected upon consideration that funds are made available in a local bank and checks may be cashed without charge, trade requirements, or inconvenience to the worker.

"ANTI-KICKBACK STATUTE" AND REGULATIONS

The Contractor and each of his subcontractors shall comply with the following statutes (and with regulations issued pursuant thereto, which are incorporated herein by reference):

Title 18 U.S.C., Section 874:

"874. Kickback from public works employees. -- Whoever, by force, intimidation, or threat of procuring dismissal from employment or by any other manner whatsoever induces any person employed in the construction, prosecution, completion or repair of any public building, public work, or building or work financed in whole or in part by loans and grants from the United States, to give up any part of the compensation to which he is entitled under his contract or employment, shall be fined not more than $5,000 or imprisoned not more than five years, or both."

Title 40 U.S.C., Section 276c:

"276c. Regulations governing Contractors and subcontractors. -- The Secretary of Labor shall make reasonable regulations for Contractors and Subcontractors engaged in the construction, prosecution, completion or repair of public buildings, public works or buildings or works financed in whole or in part by loans or grants from the United States, including a provision that each Contractor and Subcontractor shall furnish weekly a statement with respect to the wages paid each employee during the preceeding week." Section 1001 of Title 18 shall apply to such statements.

WAGE UNDERPAYMENTS AND ADJUSTMENTS

The Contractor agrees that, in case of underpayment of wages to any worker on the project under this contract by the Contractor or any Subcontractor, the Owner shall withhold from the Contractor out of payments due, an amount sufficient to pay such worker the difference between the wages required to be paid under this contract and the wages actually paid such worker for the total number of hours worked and that the Owner may disburse such amount so withheld by it for and on account of the Contractor to the employee to whom such amount is due. The Contractor further agrees that the amount to be withheld pursuant to this paragraph may be in addition to the percentages to be retained by the Owner pursuant to other provisions of this contract.

Reissued: 7-1-71
ODL 4-58 6-1-70

construction project grant can be approved by the Department until satisfactory assurances have been made that relocation requirements are being met. These assurances are to be made on forms HEW-537B, C, and D (see App. 12, 13, 14).

CONTRACTORS' AND SUBCONTRACTORS' PAYROLLS

(a) The Contractor and each of his Subcontractors shall prepare his payrolls on forms prescribed and in accordance with instructions to be furnished by the Oklahoma Department of Libraries. Within seven (7) days after the regular payment date of the payroll, the Contractor shall deliver to the Owner a certified legible copy or copies of each such payroll. Each such payroll shall contain the statement required by the Federal Regulations issued pursuant to the "Anti-Kickback Statute," which are incorporated herein by reference.

(b) The Contractor shall not carry on his payrolls any person not employed by him. The Contractor shall not carry on his payrolls employees of a Subcontractor but such employees must be carried only on the payrolls of the employing Subcontractors.

(c) Each Contractor or Subcontractor shall preserve his weekly payroll records for a period of three (3) years from the date of completion of the contract. The payroll records shall set out accurately and completely the name and address, correct occupational classification, and hourly wage rate of each employee, hours worked by him during the payroll period, and full weekly wages, and the deductions made from such weekly wages, and the actual weekly wages paid to him. Each Contractor or Subcontractor shall make such payroll records available at all times for inspection by the Owner or his authorized representatives, and by authorized representatives of the Oklahoma Department of Libraries, The U. S. Office of Education and the Department of Labor. Each Contractor or Subcontractor will permit such representatives to interview employees during working hours on the job.

Appendix C
CONSTRUCTION
Rules and Regulations
Oklahoma
Date filed: 12-13-71
Date effective: 1-3-72

CLEARINGHOUSE INFORMATION TO APPLICANTS

NOTICE TO APPLICANTS

Effective immediately, all applicants for grants under this program are subject to the requirements of the

PROJECT NOTIFICATION AND REVIEW SYSTEM

The purpose of the system is to facilitate coordination of State, regional, and local planning and development through the establishment and use of a network of State, regional, and metropolitan clearinghouses. The functions of the clearinghouses are to identify the relationship of any project to Statewide or areawide comprehensive plans, and to identify the relationship of any project to the plans or programs of particular State agencies or local governments. The system is the means of carrying out the policies and directives of Title IV of the Intergovernmental Cooperation Act of 1968 and the requirements of Section 204 of the Demonstration Cities and Metropolitan Development Act of 1966.

The project notification and review system is also designed to enable early contact between applicants for Federal assistance and State and local governments and agencies in order that there will be sufficient time and opportunity for effective coordination before the application is developed.

Applicant's Responsibilities

As soon as an applicant decides to request support from the Department for a proposed project and has filed a Notice of Intent under this program, the applicant:

1. Must notify both the State and either the regional or metropolitan clearinghouses of the intent to apply for Federal assistance at least sixty days before a formal application is submitted to the funding agency. The notification must contain sufficient information to enable the clearinghouses to review the proposed activity and to determine those other agencies within the clearinghouse area which would have an interest in the proposed project. The information to be included in the notification and a suggested format for its presentation are shown on the attachment to these instructions.

2. Must confer with the clearinghouse(s) or other appropriate agencies when so requested to discuss any issues which the proposed project may have raised to resolve such issues, if possible while the application is under development, and incorporate agreed upon modifications.

3. Must send the completed application to the clearinghouse(s) for comment if issues remain unresolved and the clearinghouse notifies the applicant of its intent to make comments.

cal year in which the expenditure was made under the State plan; or, if a Federal audit has not occurred within three years (1) for five years after the close of the fiscal year in which the expenditure was made under the State plan or

CLEARINGHOUSE
INFORMATION TO APPLICANTS

4. Must include with the application, when submitted to the Department, a statement that the procedures outlined above have been followed, and that (a) no comments have been received from the clearinghouse(s), (b) that the comments of the clearinghouse(s) have been considered in the development of the application, or (c) that the comments of the clearinghouse(s) on unresolved issues are transmitted with the application.

Addresses of Clearinghouses

A Directory of Clearinghouses is a part of this Appendix C. The regional or metropolitan clearinghouse to which the Notification is sent is the clearinghouse which has responsibility for the geographic area in which the proposed activity will take place.

Time Schedule for System

1. The notification must be sent to the clearinghouse at least sixty days before a formal application is to be submitted to the funding agency.

2. Clearinghouses have 60 days after receipt of notification from the applicant in which to disseminate the information in the notification to other appropriate State, local, regional, or subregional agencies; and in which to make their own review of the information. Within this 60 day period the clearinghouse(s) should also arrange with the applicant conferences or consultations on any issues raised on the proposed project.

   a. A notification under any program which requires an enviornmental impact statement must be accompanied by a statement of the nature and extent of environmental impact anticipated.
   b. A notification relative to any proposed project which will involve construction (buildings or other permanent facilities) must be accompanied by a sketch location map in sufficient detail to enable any reviewing agency to pinpoint the exact location.

3. If by the end of 30 days the applicant receives no request from the clearinghouse for further consultation, or if all issues raised are resolved through discussion between the applicant and the interested agency, applicants may complete and submit the application to the Department (except see 5 below).

4. If issues raised are not resolved through discussion, the clearinghouse may notify the applicant that it wishes to make comments on the completed application. Applicants must then submit the completed application to the clearinghouse before it is sent to the Department, and allow the clearinghouse 30 days in which to file comments with the applicant (see also 5 below).

CLEARINGHOUSE INFORMATION TO APPLICANTS

5. Applicants who intend to apply for a construction grant which is subject to Section 204 of the Demonstration Cities and Metropolitan Development Act of 1966 and which is located in an area covered by a metropolitan clearinghouse must be notified in writing by the metropolitan clearinghouse that it has no comment to make on the notification, or, if the clearinghouse has asked to comment on the application must allow 60 days for the clearinghouse to make such comments.

Submission of Application

The notification to the clearinghouses, discussions to resolve issues while the application is under preparation, and the receipt of comments on the completed application (when necessary) are all actions to be completed before the application is submitted to the Department. Applications received which have not been processed through the project notification and review system in accordance with these instructions will be returned to the applicant as incomplete. The Department will notify the clearinghouse of all grants made.

(d) The Contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

STATE APPLICATION IDENTIFIER 1-8		CARD TYPE 9						
10-11 01	APPLICANT PROJECT TITLE 12-71							
02	APPLICANT AGENCY 12-45				DIVISION 46-79			
03	APPLICANT ADDRESS (street) 12-45				CITY 46-60	COUNTY 61-75	ZIP CODE 76-80	
04	CONTACT PERSON 12-45			AREA 46-48	PHONE 49-55	EXT 56-59		
05	line 1 12-71	PROJECT DESCRIPTION - NATURE, PURPOSE AND BENIFICIARIES (use 6 lines if needed)						
06	line 2 12-71							
07	line 3 12-71							
08	line 4 12-71							
09	line 5 12-71							
10	line 6 12-71							
11	PROJECT LOCATION CITY 12-45				PROJECT LOCATION COUNTY 46-79			
12	FEDERAL FUNDS: GRANT 12-19	FEDERAL FUNDS: OTHER 20-27 **	MATCHING FUNDS: STATE 28-35	MATCHING FUNDS: LOCAL 36-43	OTHER FUNDS 44-51 ††	TOTAL FUNDS 52-60		
13	TYPE OF OTHER FEDERAL FUNDS 12-45 **				TYPE OF OTHER NON-FEDERAL FUNDS 46-79 ††			
14	FEDERAL PROGRAM TITLE 12-71							
15	FEDERAL AGENCY NAME 12-45				FEDERAL SUB-AGENCY 46-79			
16	FEDERAL CATALOG NUMBER 12-31	ACTION DATE 32-37: MO.	DAY	YEAR	STARTING DATE 38-43: MO.	DAY	YEAR	ENDING DATE 44-49: MO. DAY YEAR
17	TYPE OF APPLICANT: (check the single most applicable box) STATE 12 ☐ INTER-STATE 13 ☐ COUNTY 14 ☐ CITY 15 ☐ SCHOOL DISTRICT 16 ☐ SPECIAL UNIT 17 ☐ COMMUNITY ACTION 18 ☐ SPONSORED ORGANIZATION 19 ☐ OTHER 20 ☐							
	TYPE OF ACTION: (check as many boxes as apply to this action) NEW GRANT 21 ☐ CONTINUATION GRANT 22 ☐ SUPPLEMENT GRANT 23 ☐ INCREASE DURATION 24 ☐ DECREASE DURATION 25 ☐ CANCELLATION 26 ☐ INCREASE DOLLARS 27 ☐ DECREASE DOLLARS 28 ☐							
	IS STATE PLAN REQUIRED? YES 29 ☐ NO 30 ☐	IS PROJECT UNDER A95 JURISDICTION? YES 31 ☐ NO 32 ☐	ENVIRONMENTAL IMPACT YES 33 ☐ NO 34 ☐	FORM 240 APPROVAL YES 35 ☐ NO 36 ☐				

VI. LIAISON WITH LIBRARY SCHOOLS AND OTHER INTERESTED BODIES

A considerable amount of time has been spent in visiting library schools and other interested bodies with the object of familiarising ourselves with the schools' teaching practices, and also to ascertain the reactions of the profession to our research. Many of our findings are similar to those contained in the report which forms Appendix D, but the lecturers' reactions to the game are summarized below:

(a) Teaching Management

Almost without exception, library school lecturers, and particularly those concerned with management, are aware of the need for a more scientific approach to problems in this field. However, they are generally unsure of the level at which management education should be applied - should all librarians be aware of management techniques, as they apply to libraries, or should courses be held in order to train "middle management"? These were some of the main queries which emerged from our talks with the staff of library schools and figured prominently in the questions asked of participants at the demonstration course (cf. section IV above).

(b) The Courses

Most library schools offer more than one course in librarianship - the postgraduate course is usually the most intensive, and there is often little time for the inclusion of items which are not part of the syllabus. A similar position holds with respect to the 2-year ALA course, and it is generally felt that changes in these courses must await rearrangement of the Library Association syllabuses. There are, however, signs that the library schools are beginning to have more direct influence in the design of these courses.

The position in the CNAA courses is somewhat different. These courses are much longer, lasting three or four years, and the schools set their own examinations - although the syllabus must, of course, be approved by CNAA. There is therefore scope for the introduction of new topics into the syllabuses and for some experimentation.

A few library schools also offer short courses, usually aimed at experienced professional librarians. These cover almost all aspects of librarianship, but can conveniently be categorised into two main types - "refresher" courses whose main aim is revision, and those courses which introduce completely new topics. Each course is devoted to one fairly narrow subject, and it was generally felt in the library schools that the Game might best be used as part of such a course, at least in the first instance.

(c) Reactions to the Game

Almost without exception library school lecturers have shown enthusiasm for the Game. They have recognized for some time that there are grave difficulties in systematically teaching management by traditional methods, especially to students who are not particularly numerate, and many lecturers are aware of the deficiencies in the present day management of libraries. The generally favourable attitudes to the Game are reflected by the willingness of lecturers to run trial courses in their schools.

(d) Facilities

A brief report on the computer facilities which are available to the schools is given in section VIII(b) below.

(e) Library Schools in the U.S.A.

American library school teachers have, if anything, been even more enthusiastic about the Game than their British counterparts. We have received a number of requests from them for copies of the Game program, and a number of library schools have indicated their willingness to incorporate the Game into their courses, and to help us with development work.

VII. RELEVANCE OF GAMING TO OTHER TYPES OF INFORMATION SERVICE

During the feasibility study we have concentrated on the managerial problems of academic libraries. This does not mean that the problems of other types of library and information service have been neglected - we have spent a considerable amount of time in visits to, and discussions with, interested parties in this field. Our conclusions are summarised below:

i) Theoretically, there is no obvious reason why games should not be used to teach information science. The main requirement before a simulation-game can be designed is the existence of a model describing the system. For instance, indexing can be taught by allowing students to use a computerised retrieval system. In the same way, once the management problems of information services have been identified and modelled, there is no theoretical bar to their use as games.

ii) One of the most widely identified management problems is that of staff allocation between various tasks, and, as mentioned in section XI below we hope to develop a game which investigates this problem in a library. In information services, staff are often required to be expert at various tasks, and since the staff of an information unit is usually much smaller than that of a library, the problem is often more acute.

iii) There are a number of other common problems which confront the managers of information services and libraries. Budgetary problems - the allocation of resources - are all-important and extremely similar (e.g. how should a total budget be divided between staff and books or other materials?) Further, the inter-library loan function of a library is similar to that of an information service.

iv) In general, the problems of information services are similar to those of libraries, and games developed for one should be applicable, when modified, to the other. However it is only fair to stress that the modifications required, though not complex, could well be lengthy and time-consuming, because of the difference in attitudes which is often apparent between managers of the two types of service, and the different frameworks within which they operate.

VIII. COMPUTERISATION

(a) How much?

All games require the use of a computer: the simplest use a set of rules which the participants enforce collectively, while the most complex require a large electronic computer to evaluate the play. The design of the game depends on the objectives of the game and the resources available. Each type of design has advantages and disadvantages, and it is necessary to weigh these in the balance before deciding which is the most suitable. The most important disadvantages of the two extreme types of game (i.e. those which make no use of a calculator and those which make full use of an electronic computer) are summarised below and in Fig.6.

i) Games which do not use a computer

(a) The game must be either very simple or very general or a very large amount of time must be spent in calculating results.

(b) Some of the students' time will inevitably be wasted either in waiting for results or in waiting for other students to take decisions.

(c) The game will tend to be inflexible and it will be difficult to introduce random variations.

ii) Games which rely solely on a computer

(a) The game will inevitably be more expensive to run than a purely manual game.

(b) Many students are unfamiliar with computers and may be distrustful of them.

(c) The student can only choose one of a number of pre-programmed courses of action and the game is therefore inflexible.

We therefore considered that the most suitable type of game (at least for demonstration purposes) would be one which combined the advantages of the two extreme types. A "mixed manual/computer-aided" type of game was therefore developed and evaluated. It retains the disadvantages that the students' time can still be wasted while the results of his decisions are calculated (due to the reduced efficiency of the input channel) and the game remains fairly expensive to run. However, a mixed manual/computer-aided game has the great advantage of increased flexibility - the need to predetermine courses of action is largely removed by the presence of a game-editor who translates the participants' decisions to machine-readable form, and the need to predetermine results is removed because these are

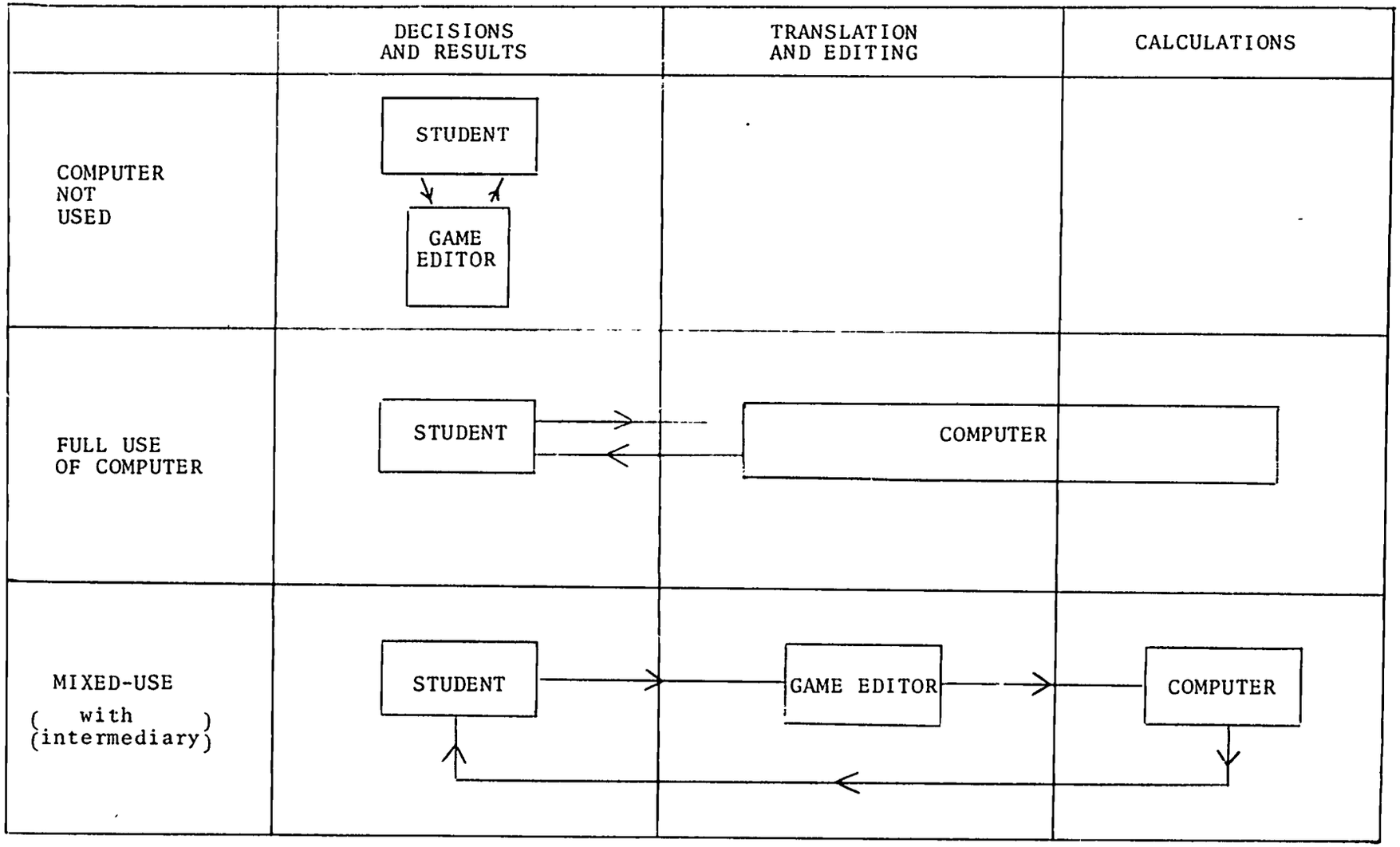

FIG. 6. USE OF COMPUTERS IN MANAGEMENT GAMING

dependent on the input, which is itself extremely variable.

We feel that this solution will probably prove to be the most effective in the schools, although some lecturers would prefer a completely computerised game.

(b) Facilities available in the schools

A survey has been conducted to determine the type of computer facilities available in the library schools - the results are contained in Table 1. As can be seen from these results, the majority of schools have access (perhaps limited) to on-line computer facilities, and more will have such facilities in the near future. We therefore feel justified in designing games which require the use of a terminal, although we do feel that the needs of the minority who have no such facility should be considered (cf. section XI).

	ON-LINE FACILITIES AVAILABLE	OFF-LINE (BUT NOT ON-LINE) FACILITIES AVAILABLE	NO COMPUTER FACILITIES
1971/2	9	3	3
Predicted availability in the "near future"	12	2	1

TABLE 1. The number of British Library Schools having access to computer facilities.

IX. COSTS

As with all costing activity, it is important here to determine the objective of the exercise. The analysis of educational costs is fraught with difficulty; education is a fundamental requirement of our society, and yet it is virtually impossible to put a concrete value on its end product. It is important to recognise that the management game is intended to form an integral part of a course in librarianship, and its cost should be viewed in the context of its effectiveness in achieving educational objectives.

(a) Costing formula

The normal accounting formula is:

Total cost = Direct cost + Indirect cost.

Each of the components, direct and indirect, can be further divided into labour, materials and services. We will discuss these as they relate to the library management game.

(b) Indirect costs

These cover the overheads involved in using the game - the rent of space for participants to sit, heating, lighting etc.; also an element representing the capital cost of the game itself. For the purposes of this exercise we can ignore indirect costs since

(i) overheads depend on the institution in which the game is used.

(ii) the capital for developing the game has been provided by the State.

Naturally in a commercial full-cost recovery operation, an element for capital charges would be included.

(c) Direct costs

To a large extent, the cost of the Game depends on how it is used. Unrestricted use by ill-informed players will become very expensive. The purpose of the Game is to demonstrate interactions which cannot easily be illustrated by other means. The Game cannot stand alone, but it would be a mistake to say that its costs should include the cost of the lectures and discussions required to put it in context. The use of the Game implies that the course of which it forms a part should have an orientation towards scientific management; in the early stages of development it may be necessary to organise special courses to demonstrate the Game, but it should eventually take its place as a part of the normal curriculum. We can thus justifiably limit the analysis to the direct costs of operating the Game.

i) Materials

In the Demonstration Course (cf. section V) participants

in the game were given a manual containing data on the library being simulated. The cost of producing this manual and various documents (reproduced in Appendix A) should not exceed 11p per student.

ii) Labour

In its present form, the Game requires an editor and a teletype operator to maintain a reasonable turn-round of results. This costs about 20p to produce results for one library for one year (i.e. one "run").

iii) Computing

The computing cost is dependent on the source of computing power. In the development of the Game, a commercial time-sharing bureau has been used. This is probably more expensive than using an in-house computer, so these figures can perhaps be regarded as a maximum. In the system used, there are three different charges:

(a) Telephone line rental. This includes the cost of installing and renting the line, and the cost of the calls themselves. The latter becomes quite significant when a long-distance line has to be kept open for several hours.

(b) Computer resource units. These are charged on the basis of the amount of time taken by the program to perform calculations, etc. in the computer.

(c) Terminal connection charge. This is charged at a fixed rate on the basis of the length of time during which the terminal is actively connected to the computer.

During the Demonstration Course, item (a) accounted for 50% of the computing cost (including the line installation charge - about 30% of the total), item (b) accounted for 20%, and item (c), 30%. (These percentages are dependent on the length of the course, the program size, and a variety of other factors). The total cost was 14p per minute - say, 70p per run.

The total cost of running the Game will depend on the number of runs allowed. In a three hour session, it should be possible to get 36 runs. Allowing one run per half-hour to each group of three students, the total cost would be not more than £36 - £1 per run or £2 per student.

In an educational institution operating its own computer facilities. it is unlikely that any actual charge will be made, although the true running cost will be about one-quarter of the commercial charge. Thus the cost of the game will be limited to labour and materials costs - say 25p per run or 50p per student.

(d) Alternative types of game

The Game so far developed is a mixed manual/computer-aided version. This form of the Game can be used by about six groups of students simultaneously.

(i) Completely manual game

The cost here would be apparently quite small, but a considerable amount of off-line computing would be required to provide the game editor and the participants with sets of tables, graphs, etc. to replace the on-line calculations.

(ii) Completely computerised game

The costing of this type of game is difficult since we have no actual example on which to conduct tests. However, during the development of the "mixed" game, we demonstrated it to a number of visitors, using an on-line mode. The following points may be noted:

(a) Since only one person may use the terminal at any one time, it may prove difficult to group participants.

(b) The main constraint on the service time is the amount of printing required, and this is much greater when no game editor is present.

(c) If unreasonable delays are to be avoided, the capacity of the terminal would be reduced to about three persons.

Using the same costs as before, this gives a figure of about £1-50 per run, or £8-50 per student. If it were possible to group the students, the per-student cost for six runs per group of three would come down to £3, which is still 50% greater than with the mixed game.

(e) Conclusion

A completely computerised game would cost about four times as much as the mixed manual/computer-aided game. It is important to realise that the costs depend on how the game is used. It would seem sensible to restrict the number of runs allowed to each participant; and in an educational institution, in which computing services are supplied on the same basis as library services (i.e. not charged for), the cost of running the game is of the same order of magnitude as the cost of a conventional lecture or seminar extending over the same period.

X. METHODOLOGY FOR THE EVALUATION OF LIBRARY AND INFORMATION SERVICE MANAGEMENT GAMES

The evaluation of management games in librarianship and information science must take account of two main queries:

(i) Is the management game capable of attaining its educational objectives?

(ii) Is the management game acceptable to the teaching profession, and is it likely to be used?

Although there is inevitably some overlap between these two questions, we have designed separate methodologies to answer them. (The Demonstration Course is itself designed to answer both questions, and is covered in detail in section V and Appendix A).

(a) Is the game educationally valuable?

One aspect of the development of a game must be its testing in the situation in which it will be used; we intend that the prototype game developed during this feasibility study should be tested in one or two selected British library schools in the near future, using library school students as "guinea-pigs".

Questionnaires have been designed to test our hypotheses about the game, although these should be modified to the more-useful interviewing technique wherever possible. The questionnaires are reproduced in Appendix C, one being used after the game has been played, the other both before and after. They will test the following hypotheses:

i) The Library Management Game increases motivation and interest.

ii) The Library Management Game increases learning.

iii) The Library Management Game improves student attitudes to the course.

iv) The Library Management Game increases the student's confidence in his own ability.

v) The Library Management Game improves the student's ability to express himself clearly.

Although much of this evaluation must be based on subjective judgments, we nevertheless hope to identify significant trends by allowing the students to quantify their own assessments. The students will also be asked to criticise the game and to make suggestions for its future development.

(b) Is the game acceptable?

This question has been answered, at least in part, by the responses of library school lecturers to the Game, both when it has been explained verbally (during liaison with the library schools) and when the lecturers have had an opportunity to use it themselves, during visits to the Research Unit and in the Demonstration Course. The Demonstration Course was our most powerful tool in this part of the evaluation, as it provided both a thorough introduction to the game and an opportunity to discuss and criticise it. It should therefore be emphasised that the purpose of the demonstration course was not to train lecturers in the use of the Game but to familiarise them with it and obtain their considered views of its potential.

XI. FURTHER RESEARCH

We believe that the work described in this report has succeeded in establishing the feasibility of designing and using management games in the education of librarians and information officers. It is important that these games should be developed and we suggest that research should continue along the lines set out below:

(a) The development of the use of gaming in library management education especially in the library schools. This is a problem of information and communication - in the first instance it may be necessary for the research team to assume some of the responsibility for development work within the schools.

(b) Further development of the Game which was produced during the feasibility study, to include a number of new areas:

  i) Non-zero obsolescence, and other complex interactions.

  ii) More realistic costing data.

  iii) The possibility of allowing the Game to be "won" should be considered.

  iv) A series of packages, suitable for different groups of students, should be developed.

(c) Exploration of new areas of librarianship and information science which have management problems susceptible to the gaming technique, and development of new games to take account of these.

(d) Continuous evaluation of the products of the research.

Acknowledgments

The authors gratefully acknowledge the invaluable encouragement and guidance of Mr. D. Hicks throughout the project, and his help in the detailed planning of the Feasibility Study.

Our thanks are also due to the many library school lecturers, information scientists and librarians who went out of their way to help us, and particularly to Mr. L. C. Guy, Senior Lecturer at Ealing Technical College, who was commissioned to write a report on the state-of-the-art of library management education (see Appendix D).

Mr. K. Croston, Senior Programmer in the Department of Operational Research was responsible for programming the Game, and Miss J. B. Nisbet of the Department of Educational Research provided advice on the design of the questionnaires.

Any inaccuracies or errors remaining in this report are of course the responsibility of the authors.

APPENDIX A

The Demonstration Course

The purpose of the Course was to demonstrate the Game. Since the Game uses concepts which are not widely understood the Course commenced with an introduction to the concept of scientific management and its application to libraries (summaries of these papers appear below). The gaming situation was described, and the participants were given a manual containing all the information relevant to the decisions required (p.39). An example of the Game in use will be found in Appendix B.

(a) Introduction to the Gaming Situation

The rôle of the participants in the Game was explained briefly - they would be expected to act as librarians in charge of a library with certain defined characteristics, and market research data would be available (see the Appendix to the Course Manual, p.43). The computerised simulation would take the rôle of the library, and would react according to the librarian's decisions. Communication between the librarian and his library (policy decisions) and between the library and the librarian (measures of performance) would take place through a game editor. The situation is shown below in Fig.7.

(b) Operational Research

Operational Research is defined as the application of the scientific method to problems of decision making in complex organisations; as a distinctive approach to the evaluation of managerial policy, strategy and tactics. The centrality of the concept of a 'mathematical model' representing the important aspects of the real decision situation was illustrated. An example of a mathematical model was constructed to deduce an optimal decision for a doctor faced with alternative treatment possibilities for a hypothetical patient. The concept of 'optimisation' was discussed and the relevance of the OR approach on the existence of 'measures of effectiveness' for the system was highlighted. The relevance of OR to management gaming was demonstrated with reference to their common reliance on a mathematical (or simulation) model of the organisation under consideration; although certain differences between a gaming and an operational model were illustrated.

(c) Loan and Duplication Policies

The effect of loan and duplication policies on availability was described, given various levels of demand. For instance, with a given level of demand, the availability of books is inversely related to the length of time for which they are borrowed (Fig.8). A number of

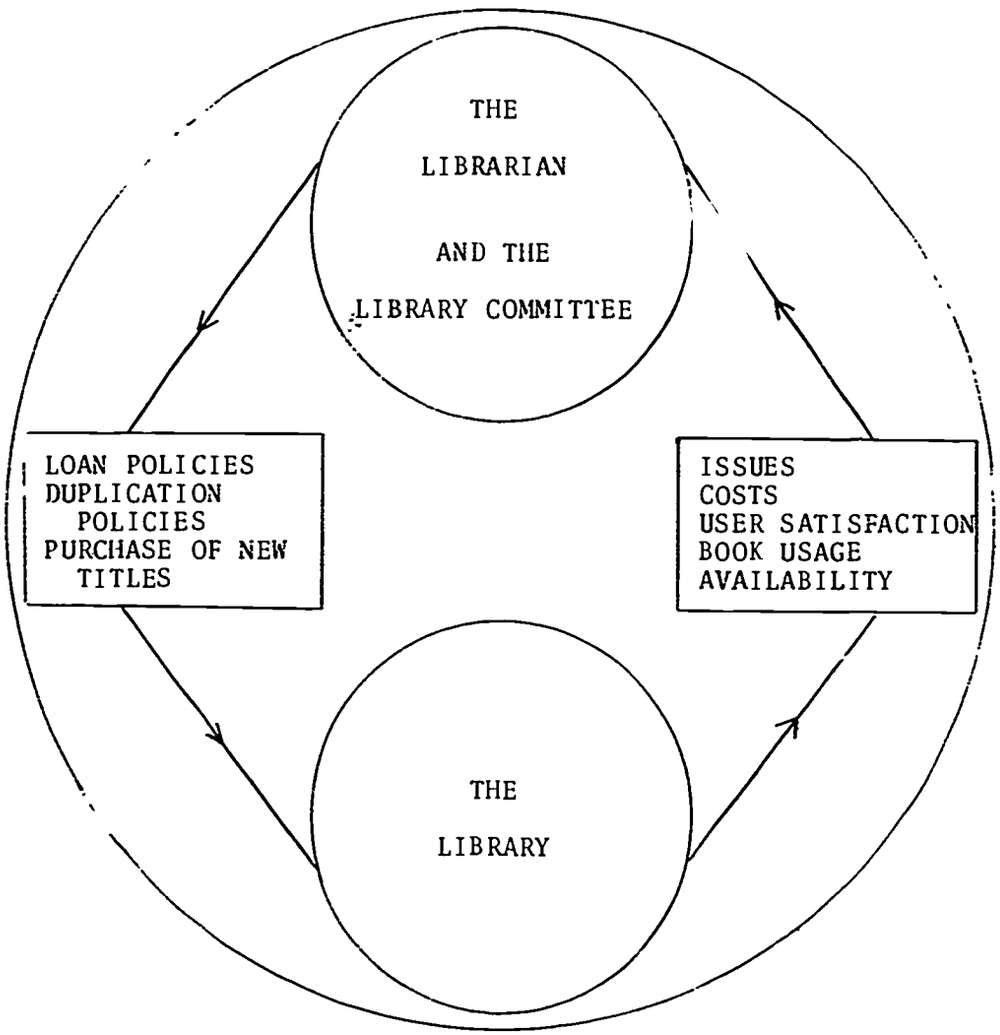

FIG. 7. THE GAMING SITUATION

other important functions were described. For instance, the relationship between the loan period and the retention time was found by the participants from data provided in the Course Manual (see p.39) after they had been shown how to analyse this data graphically, (Fig.9).

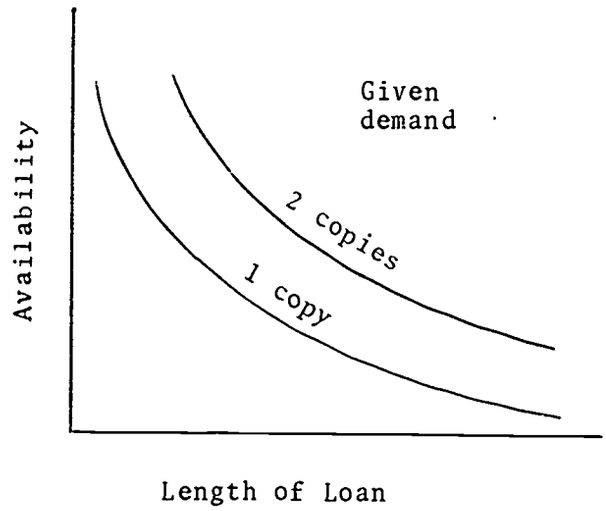

FIG. 8.

AVAILABILITY AS A FUNCTION OF LOAN PERIOD

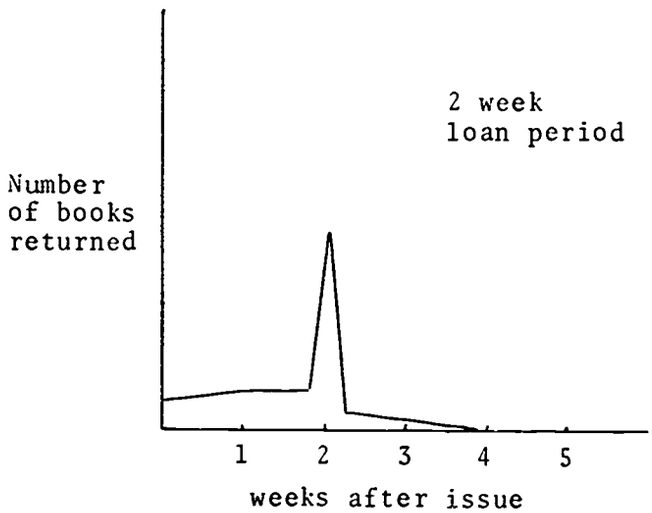

FIG. 9.

THE LENGTH OF TIME FOR WHICH BOOKS ARE RETAINED

(d) The Course Manual

The Course Manual which was provided for the participants contained a detailed description of the Course and data provided by a hypothetical consultancy company, Market Research Ltd. The Manual is reproduced on the following pages together with the literature and forms used during the Course.

UNIVERSITY OF LANCASTER

LIBRARY RESEARCH UNIT

Short course:

The use of gaming methods in teaching library management

8th - 12th March 1972

COURSE MANUAL

I. INTRODUCTION

The Library Management Game is in many ways a continuation of previous work at Lancaster on the systems analysis of the library. It makes use of some of the findings of the earlier studies, particularly those relating to loan and duplication policies. (cf. 'Systems Analysis of a University Library - Final Report on a Research Project' by M.K.Buckland and others, University of Lancaster Library, Occasional Paper No.4, 1970). When this project ended in June 1969, work on library stock control was continued. Meanwhile we had become interested in the potential for using these models educationally - as a library management game.

A proposal was accepted by OSTI in December 1970 to perform a study of the feasibility of computer-based gaming in education for the management of scientific and technical information systems and libraries. The feasibility study was scheduled to last one year, and expires in June 1972. It is part of a programme of research in the field of library management at Lancaster.

It was decided to develop a prototype game during the feasibility study based on the computerised simulation of part of a library. The present course is not presented as a 'production model', but rather as a prototype. The participants are invited to assess the potential of this type of gaming as an educational tool in the library/information science world.

It is likely that a 'package' will eventually be developed in the light of experience, but we must emphasise that the present OSTI grant was only for a feasibility study.

II. THE RÔLE OF THE PARTICIPANT

The participant will be in the position of the newly appointed director of an existing library which caters for a fairly narrow, well-defined scientific subject. Special budgetary arrangements are in force concerning non-monograph literature and an allowance for the purchase of monographs which exactly matches the effects of obsolescence on monograph stock. Therefore journals and the effects of obsolescence are outside the scope of the present simulation.

The results of a number of surveys of the library, carried out by Market Research Ltd., are available to the participant (see Appendix I). The participant must analyse and interpret these data himself. They will be the same for each participant so that it will be possible to compare the final results. It should be emphasised, however, that there is no single optimum solution to the problem.

Further information will be available from the output of a computerised simulation of the library. The computer will predict the likely consequences of any set of decisions which the participant may make, and will print out the results in the form of new values of the output parameters. The output parameters are:

a) Satisfaction level
b) Document exposure
c) Collection bias
d) Number of issues
e) Costs

These are defined in Appendix II (p.46)

The task facing the participant is described in detail in the next section.

III. THE TASK

Each participant will present a claim for a quinquennial budget to the library committee. He will be expected to justify and defend it. The claim should include the following:

1. A Request for Resources

   a) A request for a total budget for the five-year period. The committee may ask for an annual breakdown.

   b) The request should include an allocation between the purchase of books and the provision of services, cost of issues etc.

2. A Statement of Policy

   A statement of the objectives of the library, together with a description of the measures which will be used to judge performance with respect to these objectives. The statement should include an indication of how these measures will be estimated.

3. Operational Policy Statement

   a) Loan Policy - A description of the loan regulations which will be in force.

   b) Duplication Policy - The level of duplication and procedures for identifying the titles to be duplicated.

   c) Purchase of New Titles - The number of new titles which will be purchased.

4. Evidence for the Case

   An estimate, based on the simulation results, of the performance to be expected from the library with the resources specified in 1, the objectives given in 2, and the methods outlined in 3.

IV. THE SCOPE OF THE SIMULATION

The simulation is intended for use as a management aid. It will be used to provide information in the light of which decisions can be made and their effects evaluated.

The input to the computer (which will be operated by a member of the University staff who is closely involved with the project) consists mainly of:

a) Loan Periods - defined in terms of the number of titles and/or the number of borrowers subject to each loan period.

b) Duplication - defined in terms of the number of extra copies to be bought and the number of titles to be duplicated.

c) New Titles - defined in terms of the number of new titles to be bought.

The simulation is run and the first year's results are produced. The computer stores a copy of these results and waits for a new combination of loan and purchasing policies to be input (N.B. For the second and subsequent years, the starting point of the library will be the results of the previous year. The previous years' results will be over-written by the computer and lost. However, the library may be returned to its initial starting point at any time). Each participant's 'library' will be identified by a unique number, and will thus be unaffected by any decisions which other participants may make.

It should be noted that the demand on the library in a given year may be affected by the performance of the library in previous years. In particular, a successful library may stimulate demand.

APPENDIX I

MARKET RESEARCH LTD.

RESULTS OF SURVEYS CARRIED OUT IN LIBRARY

Investigation of the Distribution of Issues

A 1 in 100 random sample of all the books in the library was chosen. The date-label of each book was examined to determine the number of times that the book had been issued during the previous year, (Table 2). Books which were on loan and in the sample were checked on their return to the library. All items in the sample were traced, and the reliability of the results is therefore wholly dependent on the randomness of the sample.

Number of issues during the year	0	1	2	3	4	5 or more
Number of titles	40	24	17	10	6	3

TABLE 2

The Distribution of Demands

A similar method of sampling (again 1 in 100), from the population of users rather than that of books, was used to determine the distribution of the demands on the library (Table 3).

Number of demands, x, for a book during the year	0	1	2	3	4	5 or more
Percentage of demands which are for books in category x	0	13.2	21.6	22.8	22.6	19.8

TABLE 3.

APPENDIX I

MARKET RESEARCH LTD.

RESULTS OF SURVEYS CARRIED OUT IN LIBRARY

The Duplication of Titles

A survey of the library's stock revealed that there is no duplication whatsoever. That is, there is only one copy of every title held.

The Amount of Actual Use (Document Exposure)

For this survey the new measure of performance, document exposure (cf. Appendix II), was used. A random sample of readers was questioned as to the amount of time that they spent actually reading the books which they borrowed. The results showed that, on average, the longer a book is on loan, i.e. the greater the retention time, the more it is used. (Table 4).

Length of time book is kept on loan (days)	1	2	5	10	25	50	100
Average amount of actual use (minutes)	214	227	263	317	445	564	607

TABLE 4.

Costs

Costs were broken down into two categories - those concerned with issues (i.e. service desk staff, etc.) and those concerned with the acquisition of duplicate copies (ordering, purchasing, classifying, cataloguing, etc.). The individual costs of each of the separate processes have been combined to produce two averages:

a) Cost of issuing a book = 10p
b) Cost of purchasing and processing a book = £6-00

APPENDIX I

Retention Times

Three similar libraries were visited by the staff of Market Research Ltd. and data were collected on the length of time books were kept out. (i.e. the retention time). Data Collection days were staggered to ensure that the data did not reflect the days on which the library was closed.

Days	LIBRARY A (7-DAY LOAN)	LIBRARY B (14-DAY LOAN)	LIBRARY C (28 DAY LOAN)	Days
0	110	-	3	0
1	147	306	12	1
2	139	274	7	2
3	152	306	10	3
4	155	366	12	4
5	206	227	1	5
6	474	246	15	6
7	2236	410	20	7
8	534	270	12	8
9	173	176	7	9
10	105	219	8	10
11	91	305	11	11
12	85	236	9	12
13	84	458	18	13
14	88	1343	19	14
15	22	558	15	15
16	17	210	10	16
17	19	169	18	17
18	9	137	17	18
19	8	100	13	19
20	8	62	16	20
21	7	120	19	21
22	0	63	12	22
23	-	25	20	23
24	-	44	28	24
25	-	30	24	25
26	-	30	33	26
27	-	21	52	27
28	-	26	133	28
29	-	-	32	29
30	-	-	16	30
31	-	-	20	31
32	-	-	14	32
33	-	-	14	33
34	-	-	17	34
35	-	-	13	35
36	-	-	4	36
37	-	-	1	37
38	-	-	6	38
39	-	-	2	39
40	-	-	0	40
41	-	-	1	41
42	-	-	0	42

TABLE 5

APPENDIX II.

THE OUTPUT PARAMETERS

1. SATISFACTION LEVEL - (usually expressed as a percentage)

In a given time period (in this case one year) the satisfaction level is defined as the percentage of demands which are satisfied immediately. Alternatively, it may be defined as the probability that a borrower will find the book for which he is looking.

SATISFACTION LEVEL SHOULD BE MAXIMISED

2. DOCUMENT EXPOSURE - (usually expressed in hours)

Document exposure is defined as the amount of actual usage ("eye-to-page contact") which an individual book receives during the period it is on loan to a single reader. In the simulation, document exposure is output as:

a) The total amount of actual usage of all the books in the library during the year.

b) As the average document exposure per issue.

DOCUMENT EXPOSURE SHOULD BE MAXIMISED

3. COLLECTION BIAS - (usually expressed as a percentage)

In the majority of libraries the most popular books are removed from the shelves by borrowers. When another borrower comes to the shelves he finds that the collection is 'biased' towards the least-popular books. Collection bias is a measure of the extent of this bias, and is defined as the percentage of the 10% most popular books which is absent from the shelves. It is hence a measure of the suitability of the library for browsing.

COLLECTION BIAS SHOULD BE MINIMISED

APPENDIX III.

Characteristics of Library ____ in Year 0.

SATISFACTION LEVEL	=	55.4%
DOCUMENT EXPOSURE	=	138779.5 hours
COLLECTION BIAS	=	57.7%
NUMBER OF ISSUES	=	13855
LOAN PERIOD	=	10 weeks for all users and all books

LIBRARY MANAGEMENT GAME
SUPPLEMENT TO COURSE MANUAL

LIBRARY NUMBER

At the request of the Library Committee, Market Research Ltd. were invited to provide the librarian with certain additional information which had not previously been made available. The following supplementary information has been supplied and should be noted in the Course Manual.

(a) The library is a small academic library with 1000 registered borrowers. The user population is static; it will neither increase nor decrease during the quinquennium.

(b) The Distribution of Borrowers by Status

An investigation of the status of each borrower of a sample of books was carried out and produced the results tabulated below:

Number of times issued during the year	1	2	3	4	5 or more
Total issues (1 in 50 sample)	48	68	60	48	30
Issued to academic staff	4	5	5	4	2
Issued to post-graduate students	4	5	5	4	2
Issued to under-graduate students	40	58	50	40	26
Issued to other users	0	0	0	0	0

TABLE 6.

UNIVERSITY OF LANCASTER LIBRARY RESEARCH UNIT

LIBRARY MANAGEMENT GAME

Describe your policies in detail on this form and hand it to the Game Editor. He will translate it into machine-readable form and will return your results to you.

LIBRARY NUMBER:

LOAN PERIODS

DUPLICATION

PURCHASE OF NEW TITLES

Do you wish your library to return to year 0 before these changes are made? YES/NO

FIG. 10. Form used by participants

LIBRARY NUMBER _____

LOAN PERIODS _____ _____ _____ _____ _____ _____

DUPLICATES _____ _____ _____ _____ _____ _____

TITLES _____

This form is not to be used by participants

FIG. 11. Form used by Game Editor

LIBRARY NUMBER

Year, y	Loan policy	Duplicates bought	Titles bought	Satisfaction level (%)	Total document exposure (hours)	Average document exposure per issue (hours)	Collection bias (%)	Total issues	Cost in year y (£)	Total cost to date (£)	
0	10 weeks	0	-	55.4	138779.5	10.016	57.7	13855	0	0	

FIG. 12. Participant's record sheet

RESULTS

The policies eventually chosen by each of the six groups of participants, and their effect on their libraries, are shown in Table 7 below. They were attempting to work within a total budget for the five years of £17,000, although this did not have to be closely observed. Each group of participants presented a written summary of their proposed policies to the committee, which then discussed them, bearing in mind the following questions:

(a) Is there a reasonable division of the budget between books and services (taking into account the special allocations for serials and monographs which offset obsolescence)?

(b) How is the budget broken down annually? Are there any significant trends?

(c) How will the policies be implemented? For instance, stating criteria which involve the number of issues over the past year is better than stating criteria which make a certain percentage of stock subject to a given loan period, because the former is immediately meaningful to service-desk staff (assuming date-labels are used), whereas the latter is not.

(d) What are the objectives of the library? And why is emphasis placed on one measure of performance, possibly at the expense of another?

(e) What would be the effect of changing the policies? How sensitive is the library to such changes?

	POLICIES			STATE OF THE LIBRARY AT END OF YEAR 5							
Library	Loan policy	Duplicates bought over 5 years	Titles bought over 5 years	Satisfaction level (%) in year 5	Total document exposure(hours) in year 5	Average document exposure per issue (hours) in year 5	Collection bias (%) in year 5	Total issues in year 5	Total cost (£) over 5 years	Total cost of issues (£) over 5 years	
1	3 days and 10 weeks (note 1)	625	100	81.99		7.012	0.01		17188	13838	
2	2 weeks 4 weeks 8 weeks (note 2)	122	150	94.13	217351	6.455	10.57	33673	17388	15936	
3	2 days and 4 weeks (note 1)	80	300	94.84		5.972	0.01	33083	17868	15468	
4	1 week and 4 weeks (note 1)	100	160	94		6.5	1.8	33000	17212	15652	
5	3½ days 10 weeks (note 1)	375	200	82.75	193803	7.088	0.01	27344	16500	12480	
6	1 week 7 weeks (note 1)	200	500						17302	13102	

Note 1 - Defined by the popularity of the books
Note 2 - Defined by the type of user

TABLE 7.

Demonstration Course: Results obtained by Participants

APPENDIX B

An example of the Game in use

The left-hand column represents input to and output from the computer terminal; input (by the game editor, acting for the player) is underlined in this example for the sake of clarity. Players receive only the output for each "year".

The right-hand column is a clarification of the meaning of each transaction which takes place at the terminal; these are lettered (in this example only) for ease of reference.

For illustrative purposes, the example shows one player ("library") playing the game for three "years"; in fact up to ten players can take part simultaneously, for an indefinite number of years.

A key to some of the headings used in the output is given below:

SAT. LEV	- Satisfaction Level (%) (p.13)
COL. BIAS	- Collection Bias (%) (p.13)
DOCUMENT EXPOSURE	- Document Exposure (hours) (p.13)
AV.DOCEXP PER ISSUE	- Average amount of document exposure per issue (hours)
DUPS. BOUGHT	- Number of duplicates bought
TITLES BOUGHT	- Numbe. of titles bought
INC IN SL/£	- Increase in satisfaction level per pound expenditure
INC IN DEXP/£	- Increase in document exposure per pound expenditure

A	READY
B	RUN
C	LIBMAN 16:28 G265 E 21.12.73
D	INPUT LIBS, YEARS 1,3
E	YOU ARE LIBRARY NUMBER 1
F	? 1680 1680 1680 1680 1680 1680
G	? 0 0 0 0 0 0

A - The computer is ready to begin

B - The command to start the program is given and the program is compiled.

C - The computer outputs the name of the program, the time and the date, and then asks for the number of libraries and the maximum number of consecutive "years" for this particular run (D); the answer is 1 and 3 respectively.

E - The computer identifies the "library" and requests information by printing "?". Immediately one question has been answered, or one set of results has been output, the computer asks a further question, indicated in plain language by "?"; the main limitation on the speed at which the game can be played is the game editor's ability to translate and transmit the player's requirements.

F - The "?" is the command for a fresh input: in this case the loan policy to be followed by library 1 in year 1. The player decides to continue with a 10-week loan period (1680 hours) for all books; the editor consults Table 2 (page 43) which defines the number of titles in each of SIX popularity classes. Since all books in each class are to be subject to a 10-week loan period, he then inputs "1680" six times.

G - The next input is the number of additional duplicates to be bought within each of the six popularity classes. No duplicates at all are to be bought, so "0" is input six times.

H

```
? 0
```

I

```
35.00
40.00
57.00
68.00
79.00
99.99
```

J

```
RESULTS FOR LIBRARY 1 IN YEAR 1
```

SAT. LEV.	COL. BIAS	DOCUMENT EXPOSURE	NO. OF ISSUES	AV.DOCEXP PER ISSUE	DUPS. BOUGHT	TITLES BOUGHT
55.44	57.67	138779.5	13959	10.017	0	0

BOOKS HELD	TITLES HELD	YEAR'S COSTS	COSTS SO FAR	INC IN SL/£	INC IN DEXP/£
10000	10000	1395.9	1395.9	0.0000	0.0000

K

```
WHICH LIBRARY ARE YOU? 2
INVALID LIBRARY IDENTIFICATION. WHICH LIBRARY ARE YOU? 1
```

L

```
? 168 166 1680 1660 1660 1660
? 0 0 0 0 0
? 0
```

H - The next input required is the total number of new titles to be bought; the program will allocate these titles across the six popularity classes. Here none are required, so "0" is input.

I - This output represents the satisfaction levels (see p.13) in each of the six categories. Since this information would not normally be available to a librarian, it is usually kept by the game editor.

J - This is the output given to the player - a key to the headings appears on p.54.

K - Any player may now use the terminal; the computer therefore has to ask at the end of each cycle which player is to be considered next. As we have already specified only one library (in "C" above), "2" (which is a typing error) is not acceptable and the query is repeated. This time the correct number is input.

L - Information is input for year 2, in the same format as in F, G, H above. The player has now decided on a 1-week loan period for the most popular 9% of books (see Table 2, p.43); no other changes are made.

```
M   88.00
    94.00
    57.00
    68.00
    79.00
    99.99

N   RESULTS FOR LIBRARY 1 IN YEAR 2
    SAT.    COL.    DOCUMENT    NO. OF    AV.DOCEXP    DUPS.    TITLES
    LEV.    BIAS    EXPOSURE    ISSUES    PER ISSUE    BOUGHT   BOUGHT
    76.78   8.00    142456.1    19295     7.383        0        0

    BOOKS   TITLES  YEAR'S      COSTS SO  INC. IN      INC.IN
    HELD    HELD    COSTS         FAR     SL/£         DEXP/£
    10000   10000   1929.5      3325.4    0.0111       1.3656

O   WHICH LIBRARY ARE YOU? -1

P   LIBRARY NUMBER 1 RESTARTED AT YEAR ONE

Q   ? 700 700 700 700 700 700
    ? 0   0   0   0   0   0
    ? 0
```

M - See 'I' above

N - See 'J' above

O - The cycle restarts. The player is not satisfied with the results, and wishes to adopt a different set of policies; by inputting "-1" (i.e. the negative of his library number) he commands the computer to forget all that has gone before, and return to year 1.

P - The message is acknowledged in plain text.

Q - The player wishes to leave all books on 10-week loan for all users except undergraduates, who will be allowed to borrow books for only 3 weeks. The game editor consults Table 6 (page 48) and notes that undergraduates borrow $5/6$ of the books in each popularity class. So the average loan period in each class will be

$$\left(\frac{1}{6} \times 1680\right) + \left(\frac{5}{6} \times 504\right) = 280 + 420 = 700 \text{ hours.}$$

He therefore inputs "700" six times. No duplicates and no new titles are bought.

```
R   59.50
    62.67
    77.83
    87.00
    96.17
    99.99

S   LIBRARY NUMBER 1 RESTARTED AT YEAR ONE
    RESULTS FOR LIBRARY 1 IN YEAR 1

    SAT.   COL.    DOCUMENT   NO. OF   AV.DOCEXP   DUPS.   TITLES
    LEV.   BIAS    EXPOSURE   ISSUES   PER ISSUE   BOUGHT  BOUGHT
    76.53  34.39   151322.9   19231    7.869       0       0

    BOOKS  TITLES  YEAR'S     COSTS SO  INC. IN     INC.IN
    HELD   HELD    COSTS      FAR       SL/£        DEXP/£
    10000  10000   1923.1     1923.1    0.0110      0.5225

T   WHICH LIBRARY ARE YOU? 1
    ? 700  700  700  700  700  700
    ? 200  0    0    0    0    0
    ? 1000

U   84.89
    77.83
    87.00
    96.17
    99.99
    99.99
```

R - See 'I' above.

S - See 'J' above. These results represent year 1 of the new policy. It will be seen that the satisfaction level in this year is approximately the same as in the previous run, but that the collection bias is higher. The document exposure is also higher. The performance of this library illustrates that it is not possible to optimise all the measures of performance at the same time.

T - The cycle restarts. The library is identified by a "1". The player is satisfied with the performance produced by the loan policy already in use, and decides to retain it; "700" is input 6 times. However, he now wishes to buy 200 extra copies of books which were issued five or more times last year. He therefore inputs one "200" to represent the number of duplicates of books in this category which he wishes to purchase, followed by "0" five times for each of the remaining categories.

He also wishes to purchase 1000 new titles, to be distributed, by the computer, across the six popularity classes. He therefore inputs "1000".

U - See 'I' above

V	RESULTS FOR LIBRARY 1 IN YEAR 2 SAT. LEV. 88.21 · COL. BIAS 19.02 · DOCUMENT EXPOSURE 210888.9 · NO. OF ISSUES 26801 · AV.DOCEXP PER ISSUE 7.869 · DUPS. BOUGHT 200 · TITLES BOUGHT 1000 BOOKS HELD 11200 · TITLES HELD 11000 · YEAR'S COSTS 9880.1 · COSTS SO FAR 11803.2 · INC.IN SL/£ .0012 · INC.IN DEXP/£ 6.0289	V - See J above. The purchase of extra duplicates and new titles has resulted in an increase in satisfaction level, a decrease in collection bias and an increase in document exposure. However the costs of running the library has increased.
W	WHICH LIBRARY ARE YOU? STOP	W - The player is now satisfied; the editor therefore stops the program.

APPENDIX C

QUESTIONNAIRES TO BE USED TO EVALUATE THE GAME

Questionnaire A should be administered to students both before and after they have used the game; Questionnaire B will be administered afterwards only.

UNIVERSITY OF LANCASTER - LIBRARY RESEARCH UNIT

LIBRARY MANAGEMENT GAME

QUESTIONNAIRE A

Please read all the questions before you begin your answers. Do not confer with other players. You may spend as much time as you wish.

This is not a test of your ability or intelligence, and will be used solely to help us to evaluate our research.

I. Imagine that you have been appointed librarian of a university or college library, and that your brief is to improve the service provided by the library as quickly as possible but without a large increase in budget. One of your first tasks will be to obtain information about the library. In the table below there are eight topics about which you may or may not require information. First put a "1" in the box provided opposite the topic which you consider to be most important, then put an "8" in the box opposite the topic which you consider to be least important. Now, ignoring the two topics which you have marked, put a "2" in the box opposite the most important of the remaining six topics. Put a "7" in the box opposite the least important of the remaining five. Put a "3" opposite the most important of the remaining four, a "6" opposite the least important of the remaining three, a "4" opposite the most important of the remaining two, and a "5" opposite the remaining topic.

	Rank
THE NUMBER OF RESERVATIONS (per week) ----------	☐
THE LENGTH OF THE LOAN PERIOD(S) ----------	☐
THE TOTAL NUMBER OF BOOKS IN THE LIBRARY ----------	☐
THE NUMBER OF REGISTERED BORROWERS OF EACH TYPE ------- (e.g. students, staff)	☐
THE NUMBER OF BOOKS WHICH ARE USED A LARGE NUMBER OF TIMES PER ANNUM ----------	☐
THE NUMBER OF ISSUES (per annum) ----------	☐
THE UNIT COST OF EACH PROCESS (e.g. issuing a book) ---	☐
THE AGE OF THE COLLECTION ----------	☐

On what other factors would you require information before you could improve the lib ary service?

2. (a) What kind of relationship do you see between the total cost of a library's operations and the age of the collection?

(b) What kind of relationship do you see between the total cost of a library's operations and the loan period(s)?

(c) What kind of relationship do you see between the total cost of a library's operations and the existence of a reservation system?

(d) If you examined the library's stock, what percentage of the books would you expect to find had <u>not</u> been used during the previous year?
Ring one of the following:

Less than 5% / 5-10% / 11-20% / 21-30% / 31-40% /

41-50% / 51-60% / 61-70% / 71-80% / 81-90% /

91-95% / More than 95%.

(e) In your opinion, should the librarian try to increase the total number of issues per annum, and if so how?

(f) Do you think that management techniques have any place in librarianship? Comment

(g) How would you, as a librarian, assess whether or not a library service had been improved?

(h) Do you think that, after finishing your course and qualifying as a librarian you could run a small library service efficiently? Comment

(i) Do you think that librarians should have some training in the use of mathematical or statistical techniques? Comment

END

UNIVERSITY OF LANCASTER - LIBRARY RESEARCH UNIT

LIBRARY MANAGEMENT GAME

QUESTIONNAIRE B

Please read all the questions before you begin your answers. Do not confer with other players. You may spend as much time as you wish.

This is not a test of your ability or intelligence. It will be used solely to help us to evaluate our research.

A rating-scale is attached to each question. Please put a tick at the point on the scale which best describes your feelings. You should regard the scale as a continuous line from, for example, "good" to "bad", so that a tick at the point shown below would indicate "fairly (but not very) good":

good —/——/—✓—/——/——/——bad

and "very, but not exceedingly, bad" could be indicated by:

good —/——/——/——/——/—✓—/——bad

1. How does this course, using the Game, compare with other courses you have taken at this School?

   (a) more interesting —/——/——/——/——/——/—— less interesting

   (b) If, in the future, you were given the choice, would you prefer to take this kind of course (involving a simulation-game) or a more traditional type (lectures, seminars, etc.)?

   prefer traditional course —/——/——/——/——/——/—— prefer gaming course

(c) Do you think that you are more likely to be assessed fairly when you use the Game than when you use traditional methods?

Game Fairer —/—/—/—/—/—/— Traditional course fairer

(d) Have you learnt more by using the Game than you have learnt by traditional methods?

Learnt less —/—/—/—/—/—/— Learnt more

(e) Do you think that the Game is realistic?

realistic —/—/—/—/—/—/— not realistic

2. Did you find that you worked harder during the Game than you would in a lecture or seminar? Yes/No Comment

3. Were there any aspects of the Game which we failed to make clear? Comment

4. Are there any suggestions which you would like to make for improving the Game? Comment

5. Which aspects of the Game did you find most rewarding? Comment

6. Which aspects of the Game did you find <u>least</u> rewarding?
<u>Comment</u>

7. Has the game given you an improved "feel" for the interactions which take place within a library system?
Yes/No <u>Comment</u>

<u>END</u>

APPENDIX D

"The State-of-the-Art of Education for Library Management"

A Review

by

Leonard C. Guy, F.L.A.,
Senior Lecturer
School of Librarianship
Ealing Technical College

1. WHAT IS LIBRARY MANAGEMENT?

Before reporting on the state-of-the-art of education for library management it is desirable to establish what is meant by 'library management'. It is very simple to include in this term descriptions of processes and procedures, but the work of the Library Research Unit at the University of Lancaster is more concerned with policy analysis, the basic relationships between the various resources of a library and the interaction between any or all of these resources.

There would appear to be three different concepts which can be incorporated within the term 'library management'.

(a) Policy analysis: the allocation, division and relationship of resources.

(b) Description of processes: the administrative and organisational systems, and technical processes.

(c) Procedural efficiency: the investigation of methods and procedures to perform processes more efficiently and/or economically.

Undoubtedly all these concepts need investigation in an informed and scientific manner. In the educational process for librarianship, the coverage of (b), description of processes, and (c), procedural efficiency, is reasonably adequate. There is a great body of literature from which information may be gathered, and most of this information may be illustrated when students visit selected libraries.

So far as (a), policy analysis, is concerned, things are very different. The allocation of resources is made on the basis of decisions reached through hunch and politic devices, skills acquired through years of experience. The professional librarian is expected to acquire the ability to control his resources through the scope and depth of his experience. Patently this cannot be taught in schools.

Management research in other fields, to control industrial complexes, business organisations and so forth, has proved the need to know about, and to be able to manipulate appropriately, resources so as to produce efficiently and effectively whatever product is required.

It is at this level in librarianship that few librarians can scientifically assess what should be done, but professional managers could set up Operational Research studies and engage in systems analysis in order to reach policy decisions. The teaching side of librarianship has virtually no experience of the methods by which important policy decisions could be justified because it is drawn from the ranks of practising librarianship, which are equally devoid of such experience.

the objectives and work of Management Services Units and Organisation and Methods Teams. The various systems advocated for the implementation of management are noted, e.g. MBO, PPBS, and room is given for the inclusion of new techniques as they are developed. Use is to be made of teachers in the schools of management of the respective colleges and polytechnics.

The C.N.A.A. Courses are of three or four years' duration with management again threaded through these years, but sometimes only appearing for two of the years.

2.5. University courses

Here again the descriptions allotted to management teaching are more precise and modern than those of the Library Association, but management does not always appear as a subject to be taught throughout any course. Certainly at Sheffield and UCL some aspects of management are taught in depth (for instance, statistical methods), and the most advanced approach to the subject recorded in schools in this country takes place at such centres.

2.6. Short courses

Moving on from the acquisition of basic qualifications, the next career step upwards may rely upon the knowledge acquired by attendance at short courses. The value of these could be considerable because the motivation (promotion) to gain the knowledge provided in the course is much greater, and the student has probably decided upon the particular area of librarianship that best suits him, so that he is again studying with a stronger motivation.

Therefore, short courses concerned with library management attract committed people. The themes of these courses can be precise and confined to one topic; a suitable background will be assumed for those attending by those running the course. Experts can be engaged to expound upon particular aspects. More will be said about the value of short courses later, and a selection of titles will be given to illustrate the topics chosen.

3. RÔLE AND INFLUENCE OF EXAMINING BODIES

The syllabus content of any course is important in the depth and breadth to which any topic can be taught. Where, for instance, a superficial approach to management is all that a particular course contains, it is quite useless for a teacher to attempt to go more than fractionally deeper. The student is, or should be, aware of the area he is required to study and will have at least an inertial attitude to study beyond that area; at worst, a total resistance. Even given willingness to study further, the pressure of time needed to study the remaining topics will almost certainly preclude any reasonable attempt.

3.1. The intention of the C.N.A.A. as recently revised (1971) bears statement here:

"The Council considers ... that all courses leading to its degrees should, in addition to the specific aims of a particular course, attempt to satisfy the following limited general educational aims:

To develop in the student the ability to think logically, communicate clearly, and read critically and with understanding.

To make the student aware of the limitations of his disciplines and their methods and to provide opportunities for him to understand, make, and criticise, value judgments.

To give the student an understanding of the significance of science, technology, economics and sociological factors in modern society; of the contribution they can make to improve material conditions and in widening man's imaginative horizons and his understanding of the universe.

The Council believes that it is possible, in most courses, to bring out in the teaching the fact that scientific method, in the sense of a critical and sceptical approach to enquiry and a readiness to test hypotheses, enters at many points into subjects of the arts and social sciences..." (9).

Librarianship courses should, therefore, contain strong management content not only implicitly but explicitly, to enable librarians to evaluate the services which they provide and to study them critically.

3.2. The L.A. syllabus has remained mundane and uninspiring in its content, and is apparently caught between two attitudes - the desire to have a broad approach to librarianship, and uncertainty as to the length of time for which any course may be sustained. The two-year course could have greater management emphasis within the existing time-scale. It is not a hard course with much pressure upon a student's time. The syllabus content, in so far as library management is concerned, ranges from very specific annotations (e.g. A3 library law) to such wide annotations as to be useless (e.g. Paper 2, management, includes both principles and methods of library administration).

3.3. The post-graduate course presents a different set of problems. Three terms are quite inadequate to tackle seven subjects, especially when two compulsory subjects (G4 Practical classification and cataloguing, and G5 Subject bibliography) cause students to spend more time on them than on less explicit topics, such as G1 (The library in society) and G2 (The management of libraries). No matter that the student is academically trained and able to study, the time

available is quite inadequate in relation to the subject area to be covered. This course has the basis of good things, but needs a sharp overhaul. It would be inadvisable to lengthen the course, so the subject matter must be restricted.

As there seems to be a slightly stronger motivation towards librarianship as a career in the post-graduate as compared with the two-year course intake, it could be argued that full career prospects must rest more upon achieving an executive post in a library; therefore the management content of the course should be increased at the expense of some other subject.

It is worth noting here that the motivation for prospective librarians to acquire their qualifications by C.N.A.A. degrees cannot yet be assessed. From available information, C.N.A.A. librarianship courses tend to draw candidates from those who would otherwise take the L . 2 year course. Some schools claim that the C.N.A.A. courses cream off the best of the applicants who wou have taken the latter, but this is not yet substantiated. The final choice lies with the candidate, and his decision could well be affected only by the desire, or otherwise, to gain 'a degree', rather than a degree in librarianship.

"At present the C.N.A.A. does not accept librarianship as a degree subject in its own right but this attitude might not be permanent. Present courses were too crowded and their acceptability to the profession untested"(7).

3.4. Both the L.A. and C.N.A.A. courses veer towards the vocational choice. The Universities offering courses in librarianship reflect the academic approach that one expects in all their courses of study. The theory of management is acceptable, but the application of such theories to library situations is sometimes lacking. Two university courses, however, do reflect the need for the contemporary librarian to be acquainted with at least some management techniques.

3.5. So, some syllabuses contain the appropriate words that could indicate a degree of management teaching. Broadly speaking, all the courses devote about the same amount of time to this topic, 2 to 3 hours per week. For adequate management teaching this is too little, and if those 2 to 3 hours are fragmented at all, the situation is worsened. It must be noted here that studying through the use of case histories, case-study methods, simulations and games requires a greater allocation of time than by 'chalk-and-talk' methods.

4. CAN ANYTHING BE DONE WITHIN THE GENERAL OUTLINES OF THE COURSES NOW EXTANT?

The L.A. course should terminate in examination papers of a more open type of question, requiring, not accounts of particular techniques or administrative methods, but thoughtful approaches to library management problems. To do this the number of questions to be answered in 3 hours must come down from 5 and 4 in 1st and 2nd year examinations respectively, to not more than 4 and 3 respectively. This would permit the entrant to think about a problem and write up his answer, rather than requiring him to put pen to paper and write for 30 to 40 minutes on a question, with little time to think. The present trend towards internal setting of questions and examining should be encouraged, because this can give teaching staff a degree of latitude in the emphases within courses which can be reflected in examinations. This latitude can do nothing but good to the profession. It commits a student to a choice of school for reasons other than geographical situation, and it enables schools to draw upon and develop any particular expertise available to them.

This is not the place to discuss the viability of other methods of 'examination', such as assessed course work, except to note that they exist and should be used where more appropriate; for instance, when simulations and games are used in teaching.

4.1. The C.N.A.A. requires schools applying for its approval to assess the capabilities of its staff as a whole and as individuals. It requires cross-fertilisation by using expert staff in other disciplines to contribute to the whole study in librarianship. College- and Polytechnic-based schools of librarianship may, therefore, use staff who have that most valuable combination of years of practical experience followed by teaching experience in disciplines other than librarianship. In any event, schools of librarianship situated in educational institutions with schools of management must make use of those staff teaching the latter discipline, providing that those staff orientate their message to explain the methods and techniques suitable for direct application to library management. Most management teaching is based upon a tangible, measurable end-product that can illustrate the benefits of good management by increased production. Libraries are thought not to lend themselves readily to such measurements and librarians tend to ignore demonstrably productive management techniques merely by saying - "it cannot be applied to libraries". The research being undertaken at Lancaster will, it is hoped, substantially disprove the implication that management techniques have no place in libraries.

4.2. A management approach to the whole question of library services could be undertaken. A library can be observed as a factory with a product to market, there are competitors to be surpassed in service to clients. The urgent need

5.7. If the profession is turning towards a graduate qualification, it does not appear on present facts that there will be other than a very slightly stronger motivation towards understanding and appreciating management. A slight improvement may be caused by the fact that the graduate, having spent longer in academic studies. is in greater need of quick success in his chosen career and should have the ability to study whatever topics appear necessary to achieve this end.

6. WHO TEACHES LIBRARY MANAGEMENT?

Most of the teachers in schools of librarianship are recruited from the ranks of practising librarians. Some teachers in specialist subjects are recruited from the teaching profession and a very few from the practising side of any other discipline.

6.1. A few, becoming concerned in the teaching of library management, have attended specialist courses on all or various aspects of management, and applied their knowledge thus gained to librarianship. Perhaps the most worrying aspect is that librarianship teaching does not attract many practising librarians; the competition for advertised teaching posts is small and the calibre of many of those appointed is not high. With the relatively small teaching force, it is perhaps understandable that no adequate special courses can be organised to instruct in teaching methods, although some schools do second staff to teaching colleges from time to time. The body of literature on teaching in librarianship is small. Many practising librarians, particularly older ones, still think either that any fool can teach the theory, and only failures at practice turn to teaching, or that it is unnecessary to have schools of librarianship for such a practical job, since it should be learnt by in-service instruction.

6.2. Teaching staff at most schools find their profession a safe haven which is not too demanding; they lack motivation to experiment, or to undertake research. This could be a sad reflection upon the uninspiring syllabuses of the various courses offered; it could also mean that motivation towards more inspired teaching is lacking because the teacher becomes depressed at the thought of some 75% of his effort being to no purpose, through the heavy wastage in the early years of ex-students' careers.

There are those staff with good intentions and a desire to inculcate in their students the critical faculties and judgment required of the good manager. The facilities offered by most of the institutions housing schools of librarianship are either inadequate or present difficulties of liaison, since they are often part of a different school. Staff/student ratios are often too poor to permit adequate attention being given to those students with more interest in library management.

Examples of what should be done are illustrated by the courses now offered at Sheffield and UCL, where aspects of management are being taught by experts in their subject and, indeed, a 'new look' is being given to library management.

6.3. Good teachers respond to the enthusiasm of a class by creating more enthusiasm. If a substantial majority of class members are merely interested in achieving a document which entitles them to a certain minimum salary, and soon places them on a reasonable grading for five years until they leave to get married, one can hardly blame teaching staff for lack of motivation.

6.4. The small number of schools must lead to little mobility in the teaching force, since all offer similar gradings and no other extra inducements are available. The geographical location of most of the schools is no added attraction, nor are the facilities and premises available much of an inducement to recruitment.

6.5. The practising librarians who have become teachers have been recruited from middle management level, and all too often have very limited experience even up to that stage so far as library management is concerned. This need not, however, be considered entirely a disadvantage, because the knowledge, the flair, may be in the teacher's equipment, and his management capability may have been far greater than his practical job required.

6.6. In the UK the opportunity for library school staff to undertake research on a scale adequate to enable them to develop an expertise is limited. The DES in its report on librarianship (14) restricted the development of all schools of librarianship because it estimated that enough librarians were being produced to meet the market requirements. This placed all schools of librarianship in the unenviable position of 'Cinderellas' when compared with other schools in their educational institutions. Effectively, expansion and development ceased except at one or two places. This in turn inhibited opportunities for research on any scale worth considering as a major contribution to library science, not because expansion and development in themselves facilitate research, but because in situations where the 'status quo' is being upheld it is difficult to persuade authority to provide time and space, let alone money, for anything more than normal routine activities. This would be less applicable in universities than in colleges and polytechnics because of the accepted place of research in the university activities; in future years it may be that all educational establishments will be encouraged to undertake some research.

If the Library Association has not funds to support research that can be done by its own Fellows, it is difficult to find financial support from other sources unless the Fellow has additional qualifications. In the case of management, very few teaching staff have management qualifications, and of these most are diplomas in public or municipal administration. Library management, no matter how knowledgeable any person is in this subject, is it not expertise that can be proved by any particular qualification. It is not yet accepted as a "speciality" or expertise that can be taught and assessed, except in one or two instances, such as Lancaster and Cambridge, where the two library research units exist.

It would help if it could be generally recognised that many Fellowships were won in years gone by, by those who today would have gone to university, if the places had been available, and achieved good passes. Some of these people teach today in schools of librarianship and are underrated in their knowledge and ability.

6.7. It is difficult to envisage any major development in the schools until the DES brake is released. There is no element of competition or specialisation involved at the moment; each school has enough applicants to fill its courses and in general has only sufficient time and staff available to continue with its routine affairs.

6.8. Some money for research is available, for example, from OSTI, but those concerned in research projects tend to jealously guard their work and to adopt a far too parochial attitude to it. Unfortunately, librarianship has always been like this. How many libraries are today experimenting with computer aid, yet without having access to each others' experiences? The schools of librarianship have the rather ineffectual Association of British Library Schools, which could so easily become a far more active and effective co-ordinating body in the teaching of librarianship.

6.9. The need appears to be for better recruitment and selection of staff for the schools, so as to attract teachers with initiative, enthusiasm and the desire to provoke in students a greater commitment to their chosen career. Some sort of teacher training course needs to be established so that those desirous of becoming teachers to the profession could gain experience and see if they have the aptitude to teach before they are appointed to teaching posts from which they cannot be discharged.

6.10. Another way to help enliven the situation would be for greater mobility in secondment each way (teachers back to practice, practitioners to teaching) for longish periods of perhaps two years.

There is something to be said for the arrangement found in many overseas schools of librarianship, which have a hard core of teaching staff supported by visiting lecturers drawn from librarians who practise within a reasonable distance of the school.

6.11. If library management can be shown to be a subject with some depth, requiring a particular expertise and interest, it would be beneficial to the profession to attract as teachers those trained in other suitable disciplines who are yet able to qualify their instruction with direct examples and applications in libraries. Very few people educated and trained in the various management processes have been inclined to try to apply these processes to libraries, or even to appreciate the need for a library to be subjected to investigation as a productive organisation. The various service industries are gradually being examined by managers with a view to measurement and the production of standards of achievement; perhaps the turn of libraries has now arrived.

A more effective approach however, could be one which has been proposed by the University of Lancaster Library Research Unit. This would be a scheme for the attachment of appropriate lecturers from schools of librarianship to the Library Research Unit for, perhaps, a term, during which they would be able to engage in an examination of management and libraries in the context of skilled advice and experiment.

The Unit is also, of course, researching the teaching of library management and the lecturers who could thus be involved would contribute to as well as gain from the work being done. The importance of such a scheme can hardly be over-stressed when a hard look is given to the whole area of current library management teaching.

7. WHAT IS TAUGHT?

This has been mentioned earlier and a short summary is all that is now needed.

7.1. In most courses that have been surveyed students are made aware of existing management terminology and definitions, and at an elementary level, of management techniques. Some courses pay greater attention than others to particular aspects of management, e.g. O and M, systems analysis, personnel management. Because most of the courses investigated in this survey are concerned with basic librarianship, however, no aspect of management is taken very far, and this is understandable. Undoubtedly, more emphasis is being paid in drawing students' attention to, for instance, costing (not 'costs'), because of the pressures these days upon the practising librarian who has, quite rightly, to attempt to justify all expenditure.

7.2. A number of libraries, academic and public, have available to them the services - either full-time or part-time - of systems analysts. Consequently, the syllabus content of the various schools reflects this aspect of practising librarianship.

7.3. It would perhaps be better if students could be taught a far more comprehensive approach to management, so that the student of today, who will become the practising librarian of tomorrow might bring a critical, analytical mind to such library management as he becomes involved in. The stumbling block is the substantial wastage that occurs within the first five years of practice. If 75% of students on a course are not interested in achieving seniority in the profession, and, therefore, in accepting posts with considerable managerial content, it is inadvisable to teach knowledge to which they will shut their minds. This may be unfair on the remaining 25%, but the teacher will be in an untenable position if he tries to run two streams in one group.

8. HOW IS IT TAUGHT?

At the elementary level of most course content, the majority of the teaching is by lecture and example investigation. This latter is not case-study, or indeed case method, but a content-centred approach.

8.1. A substantial quotation from Thomas J. Galvin (16) is relevant here:

> "There is no particular mystery about the case method, once its objectives are clearly understood. These can be stated in fairly simple terms. It is aimed, if you will forgive a bit of rhetorical license, squarely at the jugular vein of traditional library education. The objective of the case method experiments has been nothing less than the radical reformation of the library school curriculum, towards the end of bringing into existence a kind of professional education that is worth having.
>
> Unless this is clearly understood, the whole point of the adoption of the case method will be missed. The use of case studies has not been, for us, merely an attempt to spruce up the standard curriculum. It is not a pedagogical gimmick to make the program of study more popular or more palatable. In education, ends must determine means. The reverse seems to me either irresponsible or intellectually dishonest. Those who have chosen to teach by the case method, or by some analogous problem-centred approach, have done so chiefly because the traditional content-centred curriculum seemed a less successful means of achieving a radically revised set of educational objectives.

I have used the qualifying adverb "chiefly" in the last sentence because the success of any teaching method depends ultimately upon the individual who employs it. The choice of a method must, then, it seems to me, remain a personal decision for each instructor to make on the bases of educational objectives and individual talents, abilities and tastes. No teacher ought ever be urged or compelled to use a method of instruction with which he feels uncomfortable, because to require this is to destroy the capacity to make a creative contribution in the class-room. For this reason, Simmons College has consistently rejected a syllabic approach to library education, and has left every instructor basically free to determine both the content and the method of his courses. Indeed, a major result of the development of the case method has been to broaden the range of choice for those who find more conventional patterns unsatisfactory or unsuitable".

8.2. Although many schools may be introducing a small degree of case-method learning, some rôle-playing, some simulation, there is as yet no body of teaching practice which legitimately can be called an original approach to librarianship instruction. With the greater freedom and independence of examination this may come, but it will be a slow process to move away from 'chalk and talk'. The practising librarian must become acquainted with management techniques first, otherwise he is unlikely to listen to a student recently out of library school propounding suitable management systems to apply in his library. Every situation, every idea, must first be related to the human situation in an organisation.

8.3. Abstract concepts are taught in the schools in cataloguing and classification - why not in management also?

The first concept to consider concerns the modern library with many needs to meet, and resources that are not fully explcited. Librarians need to be made aware that the effective exploitation of all resources is a major responsibility which can only be understood if they have a full appreciation of good management, i.e. that the librarian is someone responsible for providing a library service, and that to carry out this responsibility various skills are needed - cataloguing, bibliographic knowledge, management knowledge.

A library does not organise and run itself. The librarian must appreciate that it is part of his job to organise and administer the service; to measure output; to appraise systems, methods and procedures critically; to control staff and their work-loads; in fact, to direct the library services. This must be just as much a part of the job as assistance to readers, cataloguing and classification.

and commented upon as to their importance to the future of librarianship. Management information useful to the librarian may have to be gathered by a trained manager and its evaluation undertaken by consultation between the librarian and manager. At a lower level, an administrator may be concerned in evaluating processes and procedures, and because some of these processes and procedures are closely linked to a librarian's duties, he (the librarian) should be acquainted with them in some detail. This is very different from all student librarians being taught 'policy analysis', but it does not mean that they should not know about its existence.

Library administrative processes need to be known about at basic instruction level. Library management is of a more advanced nature where study must be based upon some experience and needs considerable motivation to apply it.

2. PRESENT COURSES IN LIBRARIANSHIP

The following courses are available to students of librarianship wishing to acquire their basic qualification, whether the Associateship of the Library Association or a degree in librarianship.

(a) The Library Association - 2 year course.

(b) The Library Association - post-graduate course.

(c) The Library Association - mature entry scheme.

(d) C.N.A.A. and University first-degree courses in both librarianship and information science.

(e) University post-graduate courses in both librarianship and information science.

Because the measurement of library activities has not been possible until recently this is not to say that measurement is not needed. The pressures upon the availability of all resources in any library are greater than ever before. Perhaps the librarian of the past 'had it too easy', and was inefficient in not fully exploiting his resources.

There is no doubt now that he must be fully conversant with the management of his organisation, and, as aides, there may be the need for experts in systems analysis, operational research, personnel management, to whom the librarian may turn for advice, while realising that the decisions lie in his hands alone.

8.4. To return to how library management is taught, advances are being made both in this country and the USA. Rôle-playing schemes are being developed at, for example, Florida State University, School of Library Science, as reflected in the work of Dr. Martha Jane K. Zachert (45).

The author of this report is experimenting with various ideas, but as in all teaching, experimentation must be careful and slow for fear that trying out a new idea may fail as a teaching aid and inhibit, if not worse, the students upon whom it was inflicted. As has been stated already, syllabus limitations are also a grave restraint.

8.5. Other methods of teaching are commonplace but none-the-less useful; tours and attachment to a library during a two or three year course are examples. A student may see in action what has been described in class. The world of theory and the world of practice are drawn closer together to the advantage of both. Attachments can provide valuable experience where little existed prior to attending a school, and can provide a change of environment to a fairly experienced student if he is sent to a type of library different from that which he

up to three hours per week to this topic throughout the two years. Management topics are studied at an elementary level.

2.2. L.A. post-graduate course

One of the seven papers to be studied is concerned with library management; again about 3 hours per week is devoted to this subject over the three terms of this course, and only at an elementary level.

2.3. The mature entry scheme

The concept here is totally different, and since entrants must be experienced in the work of an information service, it may be assumed that they have considerably more experience in management and administration than those normally taking the two L.A. courses previously mentioned. Of the short courses of study which are a requirement for qualification under this scheme, it is probable that one will be on some management topic at a fairly advanced level.

2.4. C.N.A.A. degree courses

To examine this field is a little more difficult because of its relatively recent implementation. All the syllabuses examined show in their content considerable detail in the listing of management topics to be taught. It would appear that some of the techniques of management are to be taught, e.g. systems analysis, flow charting, critical path analysis, work measurement, etc., etc. Students will be instructed in

9. COMPARISON WITH SOME OTHER COUNTRIES

Every library school catalogue from the USA includes a proportion of 'library management' instruction and it would seem that the content of these courses compares favourably with management instruction in business courses. It would appear also that because the student of librarianship in the USA is some 5 to 7 years older than in the UK, there is a better appreciation of the necessity to learn about management techniques. Certain individual efforts, (such as Dr. Zachert at Florida State University, School of Library Science, has prepared) present simulation studies that are available to students as a 'package' to illustrate specific problems of, say, personnel management, or planning.

9.1. In Europe, so far as can be ascertained, the course content is traditional, perhaps even conservative. The senior librarian gains management knowledge through practice and experience and some aid from short courses. Syllabuses from schools in developing or recently established countries again show a traditional approach, very concerned with common 'house-keeping' techniques for the library.

9.2. The conclusion may be drawn that only in the USA and UK is any real attempt being made to discover what management education the librarian really wants, and how to teach the acquisition of such an education.

10. CONCLUSIONS

From the preceding survey certain inferences may be drawn. Any course in librarianship must aim to teach the student the skills necessary to become a good librarian. It is possible that no course examined in the UK gives enough attention to stock selection and maintenance as items with which a librarian must be well acquainted. It can be argued that all student

government area, amalgamation and changes of boundaries are producing quite large library units and it is conceivable that the management services inherent in the library service needs of these organisations should be provided by management-trained personnel.

However, these aides could only provide the librarian with advice and specific information relevant to their own expertise. If management is concerned with policy, only the librarian can correlate and assess the implications of particular advice or comment. For this, management ability is needed, something which at the moment is not taught in any course in sufficient depth to permit the student to become a manager, but merely to become an administrator, who implements procedures and systems decided upon by somebody else. One important aspect of management is leadership, others are direction and planning. It is not enough to know about systems and methods, the library manager has to implement the whole process of management to make the library operate as nearly as possible at its optimum level of effectiveness.

10.2. There would still be scope and the necessity for short courses in particular management topics, both for those librarians interested, and for other staff whose functions demand such knowledge .

10.3. Simulations and games, which demonstrate the interplay of the resources of libraries and the techniques of librarianship, must surely be most valuable in educating the experienced, committed librarian. He will understand the implications of the problems being posed and he will be able to evaluate, to some extent at least, the process and progress of the game and its results. The game, therefore, becomes to him a viable method of learning more about library management.

10.4. The most important contribution must, therefore, lie in integrating into librarianship teaching aids which may be used in training library managers in decision making, in judgment, and in encouraging them to discover and use the information necessary to create more effective libraries with the resources available to them.

10.5. A 'short' course for this purpose might be of one week to three weeks' duration, depending upon the course content. There must also be considered the desirability of longer courses, or of short secondment, where the candidate could achieve fuller expertise by, for instance, being committed to carry out exercises or simulations in laboratory conditions to exhaust the implications of compiling management information. These longer courses would be aimed at educating the manager to a very high level of ability.

Through such education and experience the profession could build up a pool of expertise which would be valuable and available to all librarians. This need not preclude the development and incorporation of suitable games into first level courses for teaching purposes.

10.6. The future of library management studies lies in the provision of short courses on specific topics aimed at educating the librarian of some experience who has the motivation to progress in his chosen career. What now need investigating are the areas of management study which it is desirable to teach, the level at which they should be taught, and the length of time for which most libraries will willingly send suitable staff. There are other administrative matters needing attention; a fair allocation of courses on a geographical basis so that staff can be encouraged to attend on a non-residential basis as well as residential; an annual programme of courses co-ordinated by some body or other, (possibly the Library Association, or ABLS) so that all aspects of management are covered to the extent to which the market requires, and unnecessary duplication is avoided.

10.7. There will be some benefit to the schools presenting such courses. The teaching staff of each school at which courses were based would reap the benefit of visits by appropriate experts, their knowledge of management activities would be brought up-to-date, and perhaps more research would be generated.

10.8. An alternative or additional answer could be the establishment of a "School of Library Management", where courses could be directed toward a full understanding of management principles, decision-making, systems, techniques, and the use of whatever aids in teaching best lend themselves to such instruction. The school could award an appropriate qualification; the candidates accepted would be strongly motivated towards their subject. Such a school would also be a research centre in library management, to the advantage of both teaching staff and students.

11. COMMUNICATION

It is necessary that the professional bodies make themselves fully conversant with the aims and facilities of the Library Research Units. These units must not work in a vacuum, nor must they be considered to be researching in 'way out' ideas.

The profession is suspicious of an examination of its long-established tenets, but this should not be permitted to hold back research. What is needed is consultation and communication in a common language. If the bulk of the profession cannot

comprehend the ideas propounded by Morse (29), or the various University of Lancaster papers (e.g. (5)), by appreciation and application, and the profession will still work with poor management knowledge.

The ideas of satisfaction level, document usage and collection bias must be simply explained; the benefits inherent in the knowledge which new techniques bring must be capable of being understood by the 'ordinary' librarian, or else he will always be 'frightened' by them.

This places a heavy responsibility upon the research units to communicate in the language of everyday librarianship at first, until the whole profession is newly educated, and appreciative. Their first contact must be through interested people wishing to learn to comprehend, and these people should be the raw material for the first set of demonstrations of any suitable games designed to implement the effect of this knowledge of new factors.

Finally, although perhaps the new techniques may be more easily applied to university libraries, or other establishments with a captive readership, the research units must appreciate that library management information must have a common theory applicable to all types of libraries. All kinds of librarians must be attracted to study new methods, to help provide solutions to the more difficult situations inherent in the different types of library services.

APPENDIX E.

REFERENCES

1. ATTIG, J.C. The Use of Games as a Teaching Technique. The Social Studies, LVIII (1) Jan 1967, 26.

2. BOOCOCK, S.S. The Effects of Games with Simulated Environments upon Student Learning. Ph.D. Thesis. Johns Hopkins University, Baltimore, Maryland. 1966.

3. BROOKES, B.C. Optimum P% Library of Scientific Periodicals. Nature, 232, August 13 1971, 458-461.

4. BRUNER, J.S. The Process of Education. Cambridge, Mass. Harvard University Press. 1963.

5. BUCKLAND, M.K., A. HINDLE, A.G. MACKENZIE and J. WOODBURN, Systems Analysis of a University Library; Final Report on a Research Project. Lancaster. University of Lancaster Library Occasional Papers No.4. 1970.

6. BUCKLAND, M.K. and I WOODBURN, Some Implications for Library Management of Scattering and Obsolescence. Lancaster. University of Lancaster Library Occasional Papers No. 1. 1968.

7. BUNGAY, F.J. Degree Courses in Librarianship. Library Association, Library Education Group Weekend Conference, 1st-3rd October 1971.

8. CHAMIS, A.Y. The Design of Information Systems. Special Libraries. Jan 1969, 21-23.

9. CLAPHAM, M. Address to graduates. Ealing Technical College Gazette, Autumn 1971, 3.

10. COHEN, K.J., W.R. DILL, A.A. KUEHN and P.R. WINTERS, The Carnegie Management Game: An Experiment in Business Education. Homewood, Illinois. Irwin, 1964.

11. COLLEY, D.I. and J. RUSSELL, The Manchester Public Libraries Library Management Game. Library World 69(805) July 1967, 10-11.

12. CHAMBER'S Twentieth Century Dictionary. Edinburgh, 1964.

13. DARDEN, W.R. and W.H. LUCAS, The Decision-Making Game: an Integrated Operations Management Simulation. New York, Appleton-Century-Crofts. 1969. Contains a good example of a sophisticated management game.

14. DEPARTMENT OF EDUCATION AND SCIENCE, The Supply and Training of Librarians. H.M.S.O. 1968.

Grand total: 1,324

5.1. The minimum requirement is two A-level passes, usually at or above grade D, for the L.A. 2 year course, and obviously higher qualifications for the remainder of the courses. It is unusual to find any student with science-based qualifications entering the profession. Between 12% and 16% of post-graduate students entering courses had a degree in a science-based discipline, but most of these are in life science, leaving about 3% or 4% with qualifications in the physical sciences. Most A-levels admitting for entry are in history and English literature, with a fairly good representation of French, less German, a little Spanish, very little Russian.

Approximately 5% of the A-level subjects achieved are in mathematics or allied areas, with one or two notable exceptions in courses offering a B.Sc. in librarianship or information studies. Here up to 40% have A-level mathematics, but the numbers of people involved are small, about 20 for each year's intake in those schools offering such studies.

5.2. It is possible in this respect to blame the profession itself because it has not decided what, if any, academic studies are appropriate in a student committing himself to a study of librarianship. The Library Education Group of the Library Association is currently giving some thought to this, as indeed has the present author for a number of years.

5.3. Certainly the bulk of the intake of students to schools of librarianship achieve nothing above an O-level pass in mathematics. This could be argued as having some degree of influence upon their choice of career, the implication being that librarianship is considered a career in which mathematical ability is not necessary. Research being

15. FORBES, J. Operational Gaming and Decision Simulation. Journal of Educational Measurement 2(1) June 1965, 15-18.

16. GALVIN, T.J. A Case Method Approach in Library Education. Conference on Library School Teaching Methods, University of Illinois, September 1968.

17. GREENLAW, P.S., L.W. HERRON and R.H. RAWDON, Business Simulation in Industrial and University Education. London, Prentice-Hall, 1962.

18. GUY, L.C. Teaching the Management of Libraries. Library Association Record 70(4) April 1968, 91-95. A revised version of this paper appeared as: Simulated Management Library Journal 94(1) 1st January 1969, 37-41.

19. HAMBURG, M., L.E. RAMIST and M.R.W. BOMMER, Library Objectives and Performance Measures and their use in Decision-Making. The Library Quarterly 42(1) Jan 1972, 107-128.

20. HEWITT, R. Case studies and their place in education for librarianship. Library World 69(805) July 1967, 8-10.

21. HEWITT, R. Library Management Case Studies. London, Crosby Lockwood, 1969.

22. HOGAN, A.J. Simulation: an Annotated Bibliography. Social Education 32, March 1968, 242-244.

23. I.B.M. Bibliography on Simulation. New York, I.B.M. Technical Publications Department, 1966.

24. JESTES, E.C. An Example of Systems Analysis: Locating a Book in a Reference Room. Special Libraries November 1968, 722-728.

25. KIBEE, J.M., C.J. CRAFT and B. NANUS, Management Games: a New Technique for Executive Development. New York, Reinhold, 1961. 315-336.

at one school has shown that over 75% do not wish to reach positions of considerable responsibility; that is to say, a departmental head within a medium sized library service is the highest post they wish to have. These two proportions do not cover entirely the same people. Of the 25% who remain in the profession, some do not wish to reach positions which might be classified as managerial in content. Remarkably few students see themselves as future chief librarians. This may be because they shirk responsibility, and do not choose other careers because some degree of acceptance of responsibility is required early in those careers, (e.g. correct accounting for money, achieving productivity standards), whereas in librarianship, and teaching, there is as yet apparently no proof of failure or success; it is difficult to establish whether A or B is a good practising librarian, an indifferent one or a thoroughly bad one. At some later stage a few find their careers capable of being developed; a late motivation seems to take place, possibly encouraged by being in the right place at the right time.

5.5. 75% of the intake into librarianship is female. Over 80% of those occupying the top two posts, chief and deputy, are male; indeed by using some statistics this would appear to be a conservative estimate - it could be interpreted as upwards of 90%. Most special courses with a management content attract a high proportion of male candidates. Most management teaching in the schools of librarianship is done by men. (It is not possible to offer precise figures due to confusion as to what is management, or librarianship principles and so on).

5.6. Whatever may be the reason for the choice of librarianship as a career by the majority of entrants, it does not seem to be a desire to achieve senior positions.

31. PIGORS, P. and F. PIGORS, Case Method in Human Relations: The Incident Process. New York. McGraw-Hill, 1961.

32. RAIA, A.P. A Study of the Educational Value of Management Games. The Journal of Business 39(3) July 1966, 339-352.

33. RICCIARDI, F.M. et al. Top Management Decision Simulation: the AMA approach. Elizabeth Marting, editor. New York, American Management Association, 1957.

34. RUSSELL, G.F.M. and P.D. SLADE, Letter to the Editor, Sunday Times, 5th December 1971.

35. SHAFFER, K.R. The Case Method in Library Education. College and Research Libraries 19(6) November 1958, 487-490.

36. SHUBIK, M. Bibliography of Simulation, Gaming, Artificial Intelligence and Allied Topics. American Statistical Association Journal 55(Dec 1960), 736-751.

37. STONE, E.W. Methods and Materials for Teaching Library Administration. Journal of Education for Librarianship 6(1) Summer 1965, 34-42.

38. TANSEY, P.J. and D. UNWIN, Simulation and Gaming in Education. Methuen. 1969.

39. TAYLOR, J.L. Instructional Planning Systems. Cambridge, Cambridge University Press, 1971.

40. TWELKER, P.A. ed. Instructional Simulation Systems: an Annotated Bibliography. Corvallis, Oregon, Continuing Educational Publications, 1969.

41. UNIVERSITY OF LANCASTER, Report of the Librarian 1970/71. Lancaster, University of Lancaster 1971.

42. ZACHERT, M.J.K. The Governmental Library Simulation for the Study of Administration of a Special Library. Catholic

UNIVERSITY OF LANCASTER LIBRARY OCCASIONAL PAPERS

1. Some implications for library management of scattering and obsolescence, by M.K.BUCKLAND and I. WOODBURN. May 1968. Reprinted with minor corrections, February 1970. sbn 901699 03 9. 25p. postfree from the Librarian.

2. An analytical approach to duplication and availability, by M.K.BUCKLAND and I.WOODBURN. June 1968. Reprint 25p. postfree from the Librarian.

   A revised version of this report has appeared in the journal Information Storage and Retrieval, vol.5, 1969, pp.69-79.

3. Planning library services: proceedings of a research seminar held at the University of Lancaster 9-11 July 1969, edited by A.G.MACKENZIE and I.M. STUART. October 1969. sbn 901699 01 2. £2. postfree from the Librarian.

4. Systems analysis of a university library: final report on a research project, by M.K. BUCKLAND, A.HINDLE, A.G.MACKENZIE and I.WOODBURN. January 1970. sbn 901699 02 0. £1 postfree from the Librarian.

   (The above papers are also available through the ERIC Clearing House for Library and Information Sciences as Reports Nos. ED 022 502, ED 022 516, ED 045 173, and ED 044 153 respectively; applications for photocopies should be made direct to:

   ERIC Document Reproduction Service (EDRS)
   Leasco Information Products, Inc.
   P. O. Drawer O
   Bethesda,
   Maryland,
   USA 20014.)

5. North and West Lancashire and the Isle of Man: a bibliography of the geology and physical geography, compiled by JAN THORPE. April 1972. isbn 0901699 11 X. £1.00 postfree from the Librarian.

6. Computer listing of a reserve collection, by B. GALLIVAN, R.N.BAMBER and M.K.BUCKLAND. April 1972. isbn 0901699 12 8. 50p postfree from the Librarian.

Address for direct orders:

Librarian,
University Library,
Bailrigg,
Lancaster,
ENGLAND.

AGM/PB
24.iii.72